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FIELD NATURALISTS CLUB OF VICTORIA

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The Microscopical Society of Victoria

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The statements and opinions recorded in articles and papers herein are the responsibility of the respective authors and do not necessarily indicate the policy or opinions of the Club.

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PROCEEDINGS

About 100 members and friends attended the monthly General Meeting held at the National Herbarium on April 8, 1957. The President extended a warm welcome to several visitors, including Mrs. Eddy, who is a keen naturalist and photographer, from Darwin. Members learned with sincere regret of the passing of Mr. A. S. Chalk, an old and esteemed member of the Club. An appreciation of the late Mr. Chalk will be published at a later date in *The Victorian Naturalist*. The President expressed the hope that both our Past President, Mr. Tarlton Rayment, and Treasurer, Mr. A. G. Hooke, who are convalescing would be with us soon.

The attention of members was drawn to the Extraordinary General Meeting to be held fifteen minutes before the May General Meeting to consider applications for affiliation by the Ballarat, Bendigo, Colac, Creswick and Wimmera Field Naturalists Clubs with the F.N.C.V.

After some discussion concerning Club finance, machinery was set in motion to enable an adjustment to be made to the Building and Contingencies Fund and to direct Council to prepare and submit to members an accurate definition of that Fund.

The President announced that it was proposed to hold a Natural History Exhibition as part of the next Moomba Festival, and that the Gould League of Bird Lovers had convened a meeting for that purpose. Mr. Sarovich agreed to represent the Club at that meeting.

Mrs. Pearl Messmer delivered a talk entitled "Jungles of North Queensland", illustrating it with an excellent series of colour slides. The lecturer discussed the difficulties facing field botanists in the Cairns-Cooktown area, but emphasized that time and energy spent in collecting plants was well rewarded.

Exhibits included fossil shells and gypsum crystals by Mr. McInnes and marine shells (Himmites) by Mr. Gabriel. Examples of vegetation from the Buffalo Plateau were shown by Mr. Stewart and other native plants by Messrs. Hammett and Haase.

Mr. G. Coghill invited members to visit Monomeath Avenue, Canterbury, to see the autumn foliage of the Pin-oak, *Quercus palustris*.

MICROSCOPICAL GROUP

About thirty members attended the April meeting, including those from the newly-formed Entomological Group. The guest speaker was Mr. Burns of the staff of the National Museum, his subject being "The Microscope with Camera-Lucida in Entomology". Mr. Burns outlined his technique in the preparation of specimen slides, and their subsequent transference to paper with the aid of the Camera-Lucida and a sharp-pointed pencil.

Mr. Charles Middleton explained the optics of several types of Camera-Lucida to the audience, including the one on Mr. Burns' microscope.

There were ten exhibits on the bench featuring entomological subjects.

Mr. C. Nance will be the lecturer at the May 15 meeting, his subject being "The Cutting, Staining and Mounting of Botanical Sections".

Mr. C. Middleton has consented to project a number of slides on the screen, so members will kindly note that they need not bring their "mikes" along. The Botanical Group and all others are cordially invited to this meeting.

NOMINATIONS FOR OFFICE-BEARERS, 1957-8

At the General Meeting of the Club on April 8, 1957, the following nominations were received for Club Officers and Council for 1957-8:

President: Mr. W. L. Williams.

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Council: Miss M. Elder, Mr. J. R. Garnet, Mr. F. Curtis, Mr. R. B. Jemison, Mr. D. McInnes and Mr. H. Haase.

NEW FUNGI HANDBOOK

The third edition of the Club's *Victorian Toadstools and Mushrooms* (by J. H. Willis) will be on sale in the very near future, for the price of 7/6. The original format is repeated; but nomenclature has been brought up to date, extra information is supplied in some chapters, and additional features are a firm board cover (as in the recent fern book) and extra colour plate for frontispiece.

ARTICLES REQUIRED FOR "VICTORIAN NATURALIST"

Although several articles are in hand for forthcoming issues of *The Victorian Naturalist*, more are required particularly on zoological, geological and anthropological subjects. Short nature notes are always welcome even if they occupy no more than a few lines.

COMPARATIVE STUDY OF VICTORIAN BULB FLIES, *Eumerus* SPECIES (Syrphidae; Diptera)

By ARTHUR NEBOISS, M.Sc., F.R.E.S.*

The existence of bulb flies in Victoria has been known for some twenty years, and the species concerned have usually been referred to *Eumerus strigatus* (Fallen), the European bulb pest. Inquiries in the Department of Agriculture proved that they had been observed on bulb farms in the Boronia district, Victoria. Recent discoveries not only widen their known distribution, but also show that they have been incorrectly identified. Similar misidentifications have been revealed in England, Canada and United States.

Ferguson (1926) recorded seven species of *Eumerus* from Australia, including only the one species from Victoria, *E. simplex* Ferguson which was described as new. Knowledge of the distribution is limited, and species indigenous to other Australian states might also be present in Victoria. Furthermore, at that time, *E. strigatus* (Fall.) had not been recorded from Australia.

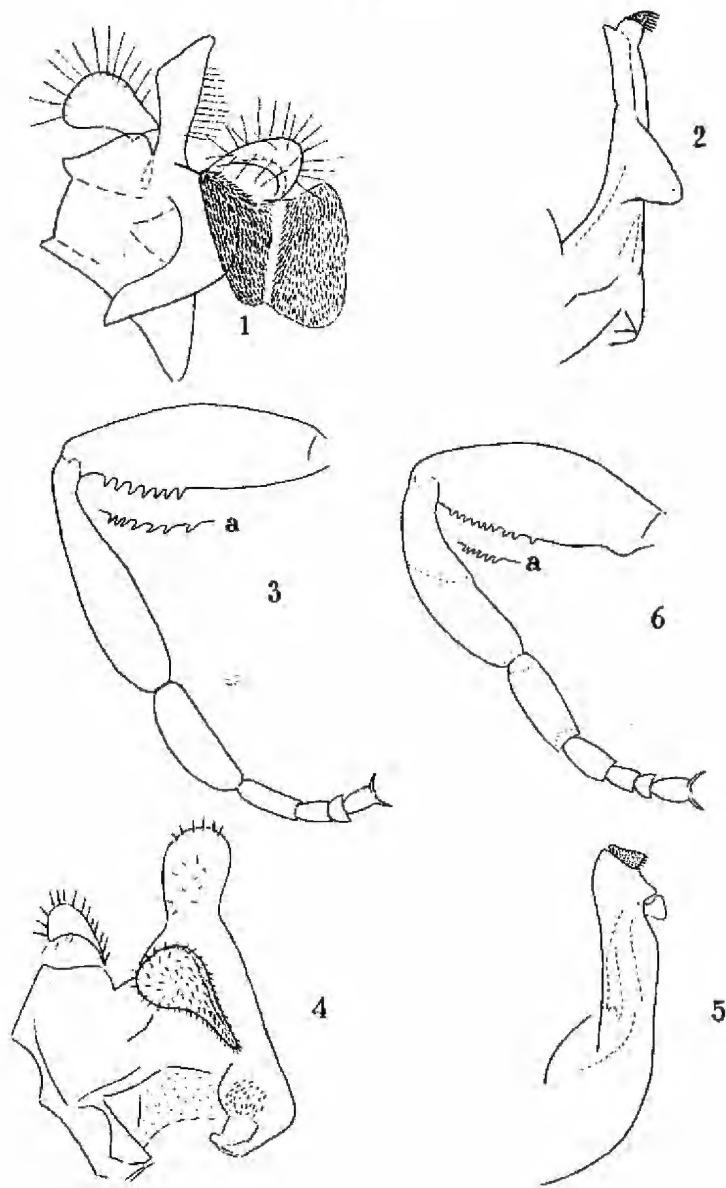
For identification of the recently-bred specimens, the author, in co-operation with Mr. R. A. Dunn, consulted overseas literature on bulb flies and found that the specimens agreed with the figures and descriptions given for *E. tuberculatus* (Rondani), and not with those of *E. strigatus* and also that the former species outnumbers *E. strigatus* not only in United States and Canada, but also in Europe. Specimens under the name of *E. strigatus* in the National Museum of Victoria and Department of Agriculture collections, also proved, on checking, to be *E. tuberculatus*, except for four that agree with the description of *E. peltatus* Meijere. The number of species occurring in Victoria is thus increased to three: *E. simplex*, *E. tuberculatus*, and *E. peltatus*. No specimens of *E. magnarti* Ferguson which has been recorded from New South Wales and Tasmania, have been seen; while *E. latipes* Macquart is known to the author only from New South Wales and Tasmania. Both species should also occur in Victoria.

E. tuberculatus is most often found in narcissus bulbs, but *E. strigatus* larvae, according to Hodson (1932), also attack iris and parsnip, and, according to Collin (1918), onions and potatoes. Craeger and Spruijt (1935) demonstrated that *E. tuberculatus* is associated with basal-rot fungi and proved it to be a secondary insect.

All recent records of *E. tuberculatus* in Victoria have been from narcissus bulbs. One specimen in the Department of Agriculture collection, Burnley, from A. E. Chandler, Boronia, and bred by Mr. R. T. M. Pescott, 8.2.1935 from narcissus, and three others prob-

* National Museum of Victoria.

PLATE I



ably from the same locality, were identified as *E. peltatus*, thus adding another species to those known to infest narcissus bulbs. No work has been done on the biology of bulb flies in Victoria, and it is not certain whether *E. strigatus* will eventually be found in Victoria or if all records should be referred to *E. tuberculatus*. Neither Mr. Dum nor the author have seen *E. strigatus* from Australia, but for identification purposes a figure of the male genitalia is included with those of the species already represented in Victoria.

It is now shown that the two rows of spines on the apical ventral part of the posterior femora are characteristic for species and at the same time are valid characters for associating males and females.

Genus *Eumerus* Meigen, 1822

There seems to be some doubt as to whether the above generic name should not be replaced by either *Citibaena* Walker (1857), or *Paragopsis* Matsumura (1916). As finality has not been reached on this question, it is thought preferable to retain in this paper the old and generally accepted name, rather than another which may be found invalid later.

Eumerus simplex Ferguson

(Figs. 1-3)

Eumerus simplex Ferguson, 1926, Proc. Linn. Soc. N.S.W. 51: 539.

A complete description appears in the above-mentioned publication. As a supplement to that paper the male genitalia of the type specimen is now figured. This species is separated from *E. tuberculatus* by the absence of the tubercle near the base of the posterior femora, and from *E. strigatus* by the equal length of both rows of spines on the posterior femora.

No material has been available for study other than the two type specimens in the collection of the National Museum of Victoria.

Life history is unknown.

Eumerus tuberculatus (Rondoni)

(Figs. 4-6)

Merodon tuberculatus Rondani, 1845, Nouv. Ann. Sci. nat. Bologna (2) 4: 256.

Eumerus tuberculatus, Rondani, 1857, Dipt. Ital. Prodri. 2: 93.

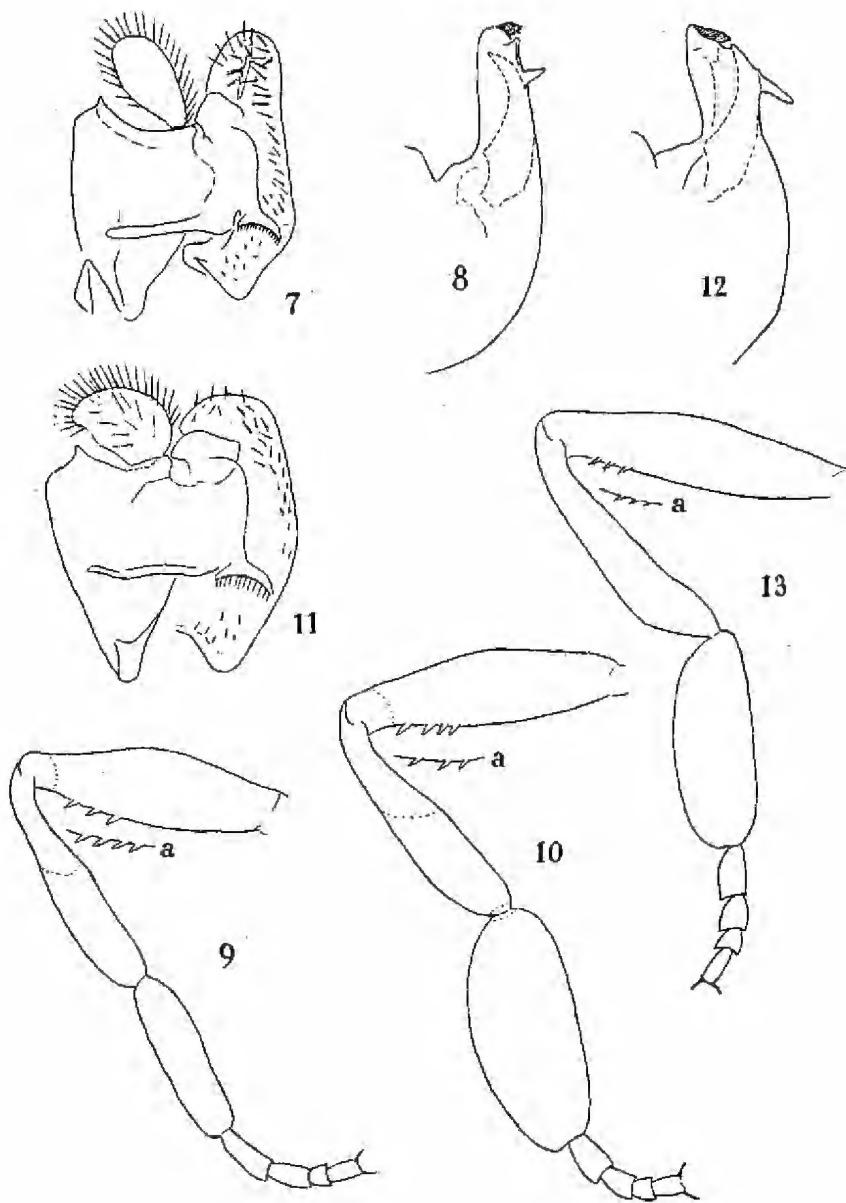
Eumerus tuberculatus, Collin, 1920, Ent. mon. Mag. 56: 102-106.

Eumerus tuberculatus, Latta & Cole, 1933, Mon. Bul. Dpt. Agr. Calif. 22: 145.

Collin described this species as follows:

"Resembling *strigatus*, but hind femora with a slight rounded projection at the extreme base beneath; basal joint of hind tarsi also

PLATE II



with a rounded, laterally compressed, projection at the base beneath, somewhat hidden by the yellow pubescence. Male genitalia very different.

"♂ Vertical triangle rather narrower than in *strigatus*, and not quite so shining; facial pubescence rather yellower; third antennal joint not so deep and therefore appearing rather longer in proportion to its depth. Thorax and scutellum not quite so shining, owing to slightly coarser punctuation; on the other hand, the abdominal punctuation is not quite so coarse or dense as in *strigatus*. Thoracic and abdominal pubescence slightly shorter. Pubescence on the abdominal sternites shorter and the last visible sternite of somewhat different shape. Genitalia very distinct from those of *strigatus*; in addition to being smaller in proportion to size of insect the various parts are of very different shape and armature, as may be seen by a comparison of figs. . . . Hind femora, in addition to the diagnostic characters . . . rather stouter, and shorter haired, this latter character especially applicable to the posteroventral pale hairs.

"♀ Frons rather narrower than in *strigatus*, and whereas in that species the front half of the frons viewed in some lights appears distinctly dusted, no dusting except on a narrow strip close to the eyes can be traced in *tuberculatus*. Thorax and scutellum with slightly coarser punctuation as in the male, and with the pubescence rather shorter than in *strigatus* and distinctly more tawny. Abdomen with shorter pubescence. The distinguishing characters of the hind legs of the male can be traced, though not so much developed."

The internal row of spines is about twice the length of the external row, and extends as far as the middle of the femora.

The figures given by Collin (1920) of the English specimens of *tuberculatus* agree so closely with those from Victoria that there is no doubt about the identity of this species. The figures included in this publication are drawn from a specimen, bred January 1957, from narcissus bulbs received from Mr. W. T. Wills, Bayswater, Victoria. Other specimens were from Carnegie and East Malvern, bred January-February 1957.

***Eumerus strigatus* (Fallén)**

(Figs. 18-19)

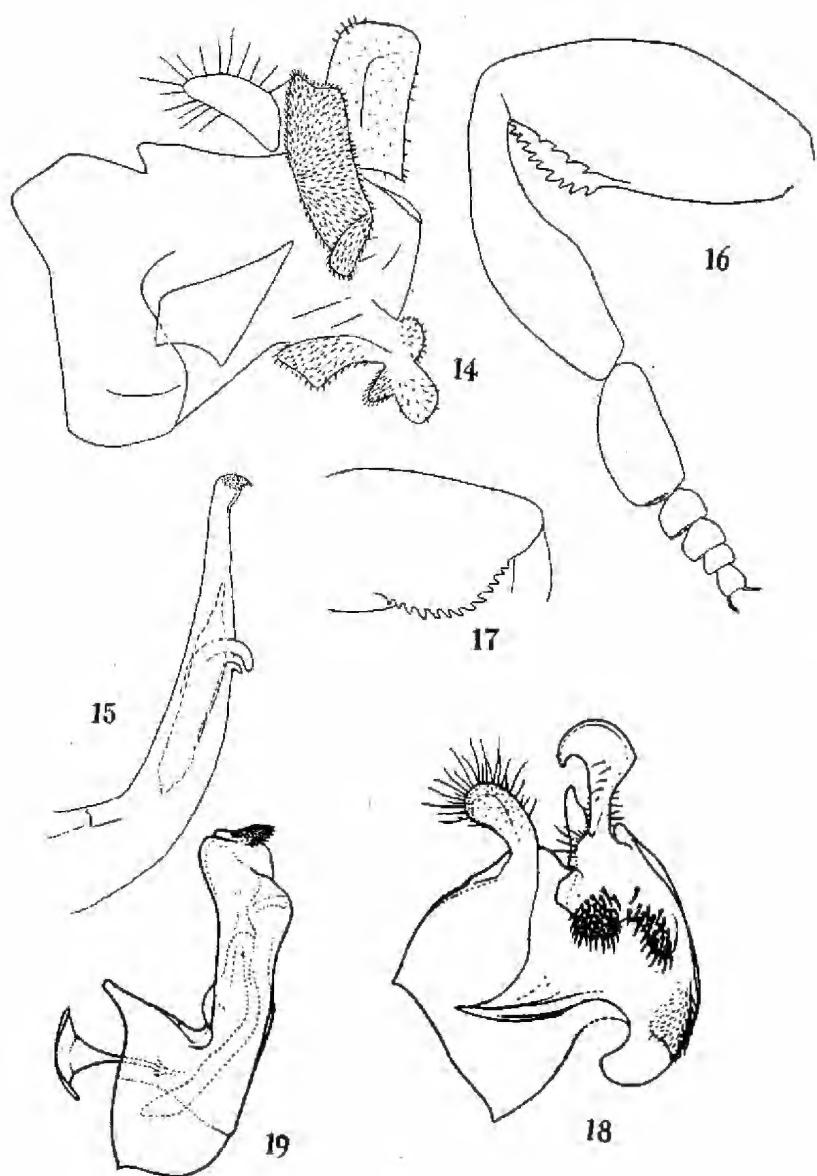
Pipizia strigata Fallén, 1817, *Dipt. Suec. Syrphici*: 61: 8.

Eumerus strigatus, Collin, 1920, *Ent. mon. Mag.* 56: 102-106.

Eumerus strigatus, Latta and Cole, 1933, *Mon. Bul. Dept. Agr. Calif.* 22: 144.

No specimens of this species are known to the author from Victoria, or Australia, but as previous records of bulli flies have been referred to this species, it is included here for purposes of comparison. Figures of the male genitalia are also given.

PLATE III



According to Latta & Cole (1933): "Hind femora much thickened, with two rows of short spines below on apical part, the posterior row continued to or beyond the middle, the anterior row present only on the apical third; . . ."

Eumerus peltatus Meijere

(Figs. 7-10)

Eumerus peltatus Meijere, 1908, *Tijdschr. Ent.* **51**: 223.

Eumerus peltatus Ferguson, 1926, *Proc. Linn. Soc. N.S.W.* **51**: 537.

This species, although originally described from New Guinea, was recorded by Ferguson from Queensland, where both sexes have been bred from native fruit and rotting prickly pear. A specimen in the Department of Agriculture collection was bred by Mr. R. T. M. Pescott 8.2.35, from narcissus bulbs received from Mr. A. E. Chandler, Boronia. The range of the species is not only extended to Victoria, but it is also of great interest to find an apparently native species breeding in an introduced genus of plants.

The genitalia show great similarity to those of *E. latipes*, but differ in details as shown in the figures. Male specimens are easily distinguished by the dilated posterior metatarsus and dense silvery pubescence on the posterior tibia and metatarsus. Females with some white hairs at the apical end of tibia.

The rows of spines are on the apical quarter of the femora only, and the spines are few in number. The definite black and yellowish-brown colouration of the femora and tibia separates this species from *E. latipes*, which has brownish legs.

Eumerus latipes Macquart

(Figs. 11-13)

Eumerus latipes Macquart, 1846, *Dipt. Exot. nov. Suppl.* **1**: 133.

Eumerus latipes Ferguson, 1926, *Proc. Linn. Soc. N.S.W.* **51**: 537.

This species appears to be closely related to *E. peltatus*, but the male genitalia show some minor differences. The posterior metatarsus is not quite so much dilated, and the tibia and tarsus are not covered with silvery hairs as in the previous species. The figures published in this paper were drawn from a Tasmanian specimen, identified by Ferguson and mentioned in his publication (1926). So far no records of distribution have been available to the author other than those already mentioned by Ferguson.

Spines are on the apical quarter of the femora only; the legs are brown, with only a slight indication of yellowish colouring near the base of the tibia.

Eumerus obliquus (Fabricius)

(Figs. 14-17)

Milesia obliqua Fabricius, 1805, *Syst. Anti.* : 194.*Eumerus obliquus* Ferguson, 1926, *Proc. Linn. Soc. N.S.W.* 51, 535.

This is an introduced species that Ferguson (1926) recorded from New South Wales and Western Australia. There are some ten or twelve specimens from Western Australia in the collection of the National Museum of Victoria identified by S. J. Paramonov of C.S.I.R.O., Canberra; one of these specimens provided the genitalia now figured.

The external row of spines is situated along the edge of a semi-circular lobe, but the internal row is normally placed. In this species the abdominal lunules are touching each other in the middle of the abdomen, and the general appearance is unlike that of any other Australian species.

Key for Separating Species Discussed

1. Abdominal markings meeting on the dorsal median line: external row of spines on the posterior femora on the edge of semi-circular lobe *E. obliquus* (Fab.)
Abdominal markings not meeting on the dorsal median line: spines on the posterior femora not on lobes 2
2. Spines on the posterior femora numerous, rows extending about half of the length of femora; posterior metatarsi not dilated 3
Spines on the posterior femora few, rows occupy the apical quarter only; posterior metatarsi much dilated in males 5
3. Posterior femora with prominent tubercle near the base
 E. tuberculatus (Rond.)
 No tubercle near the base of posterior femora 4
4. Rows of spines of unequal length; anal styles in the male genitalia ending in a recurved point toward inside
 E. strigatus (Fall.)
 Rows of spines of equal length; anal styles in the male genitalia ending in a blunt triangular apex *E. simplex* Ferg.
5. Posterior legs black, tibia with pronounced yellowish basal third; in the male the much dilated metatarsus and the tibia covered with silvery pubescence *E. peltatus* Meij.
Posterior legs brown, with less distinct yellowish markings on the base of tibia; male metatarsus dilated, not covered with silvery pubescence *E. latipes* Macq.

Acknowledgments

The author is indebted to Mr. T. W. Hogan, Chief Entomologist, Plant Research Laboratory, Burnley, for making available specimens for study from the departmental collection, and to Mr. R. A. Dunn who supplied a number of specimens for study, for carefully checking identifications, and giving valuable criticism.

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EXPLANATION OF PLATES

Plate 1

Figs.

1. Inside view of cercus and style, *E. simplex* Ferg.
2. Aedeagus of *E. simplex* Ferg.
3. Left leg from inside (♂), *E. simplex* Ferg.
a—exterior row of spines.
4. Inside view of cercus and style, *E. tuberculatus* (Rond.).
5. Aedeagus of *E. tuberculatus* (Rond.).
6. Left leg from inside (♂), *E. tuberculatus* (Rond.).
a—exterior row of spines.

Plate 2

7. Inside view of cercus and style, *E. peltatus* Meij.
8. Aedeagus of *E. peltatus* Meij.
9. Left leg from inside (♀), *E. peltatus* Meij.
a—exterior row of spines.
10. Left leg from inside (♂), *E. peltatus* Meij.
a—exterior row of spines.
11. Inside view of cercus and style, *E. latipes* Macq.
12. Aedeagus of *E. latipes* Macq.
13. Left leg from inside (♂), *E. latipes* Macq.
a—exterior row of spines.

Plate 3

14. Inside view of cercus and style, *E. obliquus* (Fab.).
15. Aedeagus of *E. obliquus* (Fab.).
16. Left leg from outside (♂), *E. obliquus* (Fab.)
17. Portion of the posterior femur showing lobe and arrangement of spines from outside (♂), *E. obliquus* (Fab.).
18. Inside view of cercus and styles, *E. strigatus* (Fall.) (after Collin, 1920).
19. Aedeagus of *E. strigatus* (Fall.) (after Collin, 1920).

SUNDY NOTES ON THREE VICTORIAN PLANTS

By A. B. COURT*

Proteaceae

CONOSPERMUM TAXIFOLIUM Sm. in Recs. Cyclophorbia 9, sub *Conospermum* n. 3 (1808).

This species was first collected in Victoria by F. Mueller "abreast of Gabo Island on the sand hummocks" during September 1860 and although he clearly recorded it as a Victorian plant, A. J. Ewart omitted *C. taxifolium* from his *Flora of Victoria* (1930), apparently under the impression that Mueller's record was erroneous. It was rediscovered by the author in late December 1955, growing on healthy flats in association with *Xanthorrhoea hastilis*, about three miles west from Howe Hill and approximately the same distance north from F. Mueller's original locality. *Conospermum taxifolium* is confined chiefly to the coastal heathlands and ranges from the Burdekin Estuary in Queensland to north-eastern Tasmania.

Crassulaceae

CRASSULA HELMSII (Kirk) Berger in *Naturl. Pflanzen*, ed. 2 18a: 389 (1930).

Tillaea verticillaris Link, *Icon. Plant.* 3: t. 295 (1840), excl.
descri., non *T. verticillaris* D.C. *Prod.* 3: 382 (1828).

T. recurva Hook. f. *Flor. Tasmania* 1: 146 (1856).

C. recurva (Hook. f.) Osten, in *Dansk. Bot. Ark.* 28: 40, 47 (1918),
non *C. recurva* N. E. Brown in *Guiana Chron.* Ser. 3 8: 684
(1890).

Tillaea helmsii Kirk, *Stud. Flor.* 142 (1899).

Comparison of a specimen of *Crassula helmsii* (Kirk) Berger, collected at Greymouth, New Zealand by R. Helms and evidently part of the type of *Tillaea helmsii* Kirk with typical Victorian specimens of *C. recurva* (Hook. f.) Osten, reveals no specific differences between the two. Since *helmsii* is the oldest legitimate epithet available for this species it must be adopted for our plant. *C. helmsii* is endemic in south-eastern Australia (including Tasmania) and New Zealand and is distinct from *C. intricata* Nees in *Lehr. Plant. Preiss.* 1: 278 (1844-45)—a West Australian plant under which it is sometimes synonymized.

Mimosaceae

ACACIA DIFFUSA Lindl. in *Edwards Bot. Reg.* 8: t. 634 (1822).

During 1822 two names were published under *Acacia*—*A. prostrata* Lodd. *Bot. Cab.* 7: t. 631 (1822) and *A. genistifolia* Link *Enam. Plant. Hort. berol.* 2: 442 (1822). The former is definitely referable to *A. diffusa* Lindl., but the identity of the second species is open to some doubt at present. Bentham, who studied *Acacia* spp. in detail, was doubtful about *A. genistifolia* for many years, but in 1875 (*Trans. Linn. Soc. Lond.* 30: 453) he assigned this species to *A. diffusa*. Apparently he had examined a link specimen as indicated by the symbol! The date on the plate in *Edwards Bot. Reg.* is 1 July 1822, and this would certainly be the earliest that it was published. Unfortunately, there is definite evidence that *Enam. Plant. Hort. berol.* was published during the first half of 1822, but the exact date of publication of *Bot. Cab.* cannot be determined from either the book itself or from contemporary publications. In view of the uncertainty surrounding the identity of *A. genistifolia* and the date of publication of *A. prostrata*, *A. diffusa* will be retained as the valid name for our Victorian plant, at least for the time being, until definite evidence to the contrary is produced.

* National Herbarium of Victoria.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

NATURE RECORD

The Junior Age has arranged for the keeping of nature records by schools and youth groups (no age limit), and it provides record books upon application. Results are checked in March, August and November, prizes for the most successful work being given by the Junior Chamber of Commerce. The objective is to increase awareness of our native flora and its need for care. Some members may like to take a hand by encouraging the keeping of a record and by helping with identification.

—W. WADDELL

BIRDS' NESTS IN FACTORY

The interior of a factory near Morwell might seem to be a queer nesting-place for birds. Five large overhead cranes run backward and forward all day, while below them electric welding goes on continuously, accompanied by the din of a steam hammer, automatic chisels and other equally noisy machines. Yet every year magpie-larks, as well as sparrows, mynas, and starlings, nest on the overhead cranes, sitting placidly while they travel back and forth, quite undisturbed by the noise and activity below, and taking no notice of the workman who services the machinery. There is much speculation in the workshop as to why the birds should choose to nest in such a place. Perhaps it is because they are safe from bird and other marauders. No one harms them, everyone is interested in them, and one of the men recently photographed them at the request of the manager.

—JOHN HYNDMAN

PHENYLE AS A BIRD-KILLER

While head teacher at Barongarook near Colac, now and again I would find the dead body of a bird in the vicinity of the school-ground, with no outward signs of wounding or violence of any kind. Over a period of about three years, I picked up bodies of Crimson Rosellas, Eastern Rosellas, Red Wattle-bird, Magpie Lark, Blue Wren, Yellow Robin, Grey Shrike-thrush, Magpie, and other birds. It worried me a great deal what could be the cause of so many deaths, so consistently near and in the school-ground.

Becoming more familiar with the habits of the birds as time went on, I felt convinced that the likely cause was my using phenyle to wash out the drains in the school-ground and to wash out the out office pans. Phenyle diluted with water was run out of the drains and lay in pools near the school boundary fence; water polluted with phenyle lay in puddles where pans were washed out. In dry weather birds sometimes drank this poisoned water and died of its effects. Apparently a very weak concentration was sufficient to kill.

I gave up using phenyle as a disinfectant; instead I used a pine variety of disinfectant-deodorant which appears not to be lethal to birds and is as good or better for cleaning purposes. Since I changed over to pine disinfectant a year ago there have been no unaccountable deaths of birds.

—CHARLES T. BARBOUR

LETTER TO EDITOR

Hon. Editor, *Victorian Naturalist*.

Dear Sir,

Sincere thanks and congratulations from all nature-lovers should go to those persons who guided the National Parks Bill through the Victorian Parliament, more especially to Messrs. P. C. Morrison and J. R. Garnet, without whose untiring work Victoria would still be without any effective preservation laws. That these are so urgently needed can best be seen by Clause 7 (ref. *Vict. Nat.* 73: 129) where thirteen areas are listed as National Parks. A line drawn from Melbourne to Echuca shows twelve of these in the one-third eastern section while two-thirds of the State possesses one National Park—Wyperfeld—perhaps the least known and most neglected of all.

Yours faithfully

Portland.

NOEL F. LEARMONTH

WHAT, WHERE AND WHEN**F.N.C.V. Excursions:**

Saturday, June 1—Parlour-coach excursion to Rosebud. Leader: Mr. C. Lewis. Coach leaves Batman Avenue 9 a.m. and will stop near shops during lunch. Members should be prepared for two meals, but hot drinks will be supplied. Bookings with the Excursion Secretary. Fare, 16/-.

Sunday, June 9—Geology group excursion to Lysterfield Hills. Leader: Mr. A. Cobbett. Details of excursion will be given at Geology Group meeting.

Group Meetings:

(8 p.m. at National Herbarium unless otherwise stated).

Wednesday, May 15—Microscopical Group.

Wednesday, May 29—Botany Group. Subject: Fungi. Speaker: Miss V. Baalan. The meeting will be held at 8 p.m. at 19 Hawthorn Avenue, Caulfield, and may be reached by taking an East Brighton No. 64, East Malvern No. 4D, or Kew-Cotham Road No. 69 tram to Balaclava Junction, Caulfield, and then walking down Balaclava Road to the first street on the left. These trams pass Caulfield, Balaclava and Malvern stations.

Monday, June 3—Marine Biology and Entomology Group. Meet at private entrance to the south end of Parliament House. The meeting will be in Mr. Strong's rooms at 8 p.m.

Wednesday, June 5—Geology Group. Microscope night for members arranged by Mr. McLunes.

MARIE ALLENDER, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7

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PROCEEDINGS

Nearly 80 members and friends attended the monthly General Meeting held at the National Herbarium on May 13, 1957. The President extended a warm welcome to new members and visitors, and expressed the hope that they would attend meetings as often as possible. The President also extended a welcome to Mr. Tarlton Rayment and congratulated him on the good recovery he had made from his long illness.

Dr. M. M. Chattaway delivered an interesting address entitled "Dunedin Science Congress and Visit to New Zealand" and illustrated the latter part of the lecture with an excellent series of colour slides.

The President announced that the Natural History Medallion for 1956 had been awarded to Dr. Serventy of Perth. Mr. H. T. Reeves has been nominated by Council for this year's Medallion.

A motion, moved by the President and seconded by Mr. W. L. Williams, that Mr. A. W. Jessep be elected as an Honorary Member of the Club, was carried.

The following were elected as members of the Club: Mr. F. W. Seed, Templestowe (Ordinary); Mr. W. G. H. Tregear, Essendon (Ordinary); Mr. J. D. Lovis, England (Country); Mr. S. R. Miller, Stawell (Country).

Miss M. Elder proposed that an increase in Club fees and the donation of a certain sum of money to an organization such as the Beaumaris Sanctuary Committee should be discussed at the General Meeting. The purposes of such actions would be to foster more interest in the aims of the Club, in making money available for establishing more sanctuaries for native flora and fauna and for setting some money aside for the Club Building Fund.

Extraordinary General Meeting

An Extraordinary General Meeting was held 15 minutes before the General Meeting to discuss the affiliation of the Ballarat, Bendigo, Colac, Creswick and Wimmera Field Naturalists Clubs. As these Clubs had paid their affiliation fees, a motion affiliating them with the Club was carried with acclamation.

Nature Notes and Exhibits

The President described an unusual growth in a fern prothallus. Further notes on this will appear in a later issue of *The Victorian Naturalist*. Mr. Garnet commented on three egg sacs of the Red-back Spider which he recently observed. The egg sacs were enclosed in a larger sac about two inches in diameter.

Among the exhibits at the meeting were a number of eucalypt paintings by Mr. Haase and a specimen of *Grevillea oleoides*, grown at Ferny Creek, by Mrs. F. R. Vasey. Other exhibits were a strip of lichen, seven feet long, from the Yarramin tropical forest in Queensland and also the fruit of the tropical Native Lemon shown by Mr. Stan. Colliver. *Hakea laurina* (Pincushion Tree of Western Australia) was exhibited by Mrs. D. S. Lewis.

Correction

In the last issue of *The Victorian Naturalist* the price of the new edition of the Club's *Victorian Tundstools and Mushrooms*, by J. H. Willis, was incorrectly given as 7/6. This should have been 6/-, and this error is regretted.

Assistant Required for University Geology School

An assistant is required by the Geology School, University of Melbourne, to help in sectioning rock specimens, model-making, etc. The successful applicant will be allowed to study part-time at a technical school. Those interested should contact the Professor of Geology at the University.

Escorts for Members Attending General Meetings

Arrangements have been made for escorts to meet members and visitors wishing to attend general meetings at the National Herbarium. Persons desiring escort should assemble at the tram shelter nearest the fountain at the corner of The Domain and St. Kilda Road not later than 7.50 p.m. These arrangements will apply to all general meetings commencing from Monday next.

PRAHRAN NATURE SHOW, 1956

By A. E. BROOKS*

On November 19, 20 and 21, the 1956 Nature Show was held, from 10 a.m. to 10 p.m. each day, in conjunction with the Prahran and District Chamber of Commerce as part of the Olympic celebrations. The auxiliary room at the Prahran Town Hall was provided free of charge by the City of Prahran, and the Chamber of Commerce provided publicity in the form of display notices, sandwich boards, references on radio sessions and in newspapers, and by means of some thousands of leaflets. Similar numbers of Olympic booklets also made mention of the Nature Show.

The Mayor of Prahran, Cr. G. J. Furnell, officially opened the show at 3 p.m. on the first day. Speeches were also made by Mr. S. Loxton, M.L.A., the President and Secretary of the Chamber of Commerce (Messrs. Ferguson

* Club organizer of the show.

and Jenner, respectively), and the F.N.C.V. President (Mr. Swaby), and by the writer.

The exhibitors are to be congratulated on the great variety and excellence of the displays. Many were the result of individual efforts, and with such a solid foundation it should be possible on a future occasion to find many more members who would be prepared to help in providing exhibits.

There are many lessons to be learnt from this Nature Show. The first is that the Club can still stage shows similar to those held before the war. Another point is that garden-grown native flowers now have a big attraction for many people, also live animals are an effective draw card, particularly for children, but for adults as well.

Those from outside the Club who helped by providing exhibits were Mr. H. R. Balfour (anthropology), Mr. W. Leach (Australian timbers, eucalypt fruits and other seed capsules), Mr. R. Willison (rock python), Mr. R. Batrouney and Mr. Shepherd (crocodiles), and Mrs. Trull and Mrs. Terrierian (flowers).

Owing to the limited amount of space available, the Mines Department was the only outside organization invited to stage a display, and it was relatively an effective one.

Mr. Balfour's anthropological display included twine made by Australian aborigines from the bark of a boabab-tree, shields, knives of bone and quartzite, stones for throwing, pounding, and for grinding seeds such as nardoo. There were lighting sticks and message sticks, hasted stones, flaked axes, woomeras, and pressure-flaked stone spear-points.

The Victorian Mines Department again had a sample of uranium ore on a revolving table. This specimen, which was 8 per cent uranium, was placed so that, as it approached a Geiger counter, continuous clicks could be heard from a loud-speaker. Samples of radium ore, secondary uranium mineral, and brannerite in the glass case completed the exhibits. The Mines Department also displayed fluor spar and radioactive secondary uranium minerals, which fluoresced when ultra-violet light was directed at them.

Mr. Swaby displayed the fruits of banksias, hakeas, the woody pear, and several eucalypts, including the very large ones of the "Rose of the West", *Eucalyptus uncinata*. Many of these seeds had been sent from near Millingen, South Australia. Garden-grown flowers sent by Mr. Althoier of the Ninelethara Nursery, Drystone, N.S.W., some fine photographs of casuarinas and a number of seedlings with flowers of various colours grown from Norbercote's tea-tree, completed the exhibits in this section.

Mr. Gabriel's splendid shell exhibits provided one of the highlights of the show. There was an example of the smallest adult shell (measuring only one-thirtieth of an inch), a twelve-inch Baler, which is the largest species to be found in Victoria, and a case of tan-shells. Mr. Gabriel further showed his ability to stage outstanding exhibits by displays of the growth-stages of Victorian rock-wheeler and cowry shells. The latter, including the largest Victorian cowry, were enhanced by their arrangement in tiers with a black background.

Mrs. Freame's excellent display of marine life created much interest and provoked many questions, particularly from school-children. Mrs. Freame took every possible opportunity to be present so that she could answer as many questions as possible. As well as the marine life, a preserved giant earthworm from Gippsland served as a reminder of the days when live specimens of these proved a great attraction at F.N.C.V. nature shows.

Several showcases contained colourful bird specimens loaned by the National Museum and the R.A.O.U., but it was the large Wedge-tailed Eagle surmounting the display boards that attracted most attention.

Live animals must be made a part of any future nature show. The two small crocodiles, loaned by Mr. Batrouney of Kew and transported to and from the show by Mr. Shepherd of the Prahran Market, livened up sufficiently on the

final night to bite the finger of one of our members who was demonstrating how harmless they were.

"Sammy", the eight-foot Rock Python, seldom unwound his coils but he showed various signs of movement and attracted much attention. For the benefit of anyone who is troubled with mice or rats, the even-tempered Sammy is for sale for the modest price of three pounds.

Mr. A. A. Baker again staged an exhibit of the very high standard we have come to expect of him. It was entitled "The Geology of Melbourne". Photographs, rock-specimens, fossil shells and sharks' teeth all contributed to the effectiveness of the display. Where are our other geologists when it comes to staging exhibits? Why leave it all to Mr. Baker?

Mr. J. R. Garnet was another member who staged an outstanding exhibit. His live specimens of Red-backed and Funnel-web Spiders, mounted specimens which could be examined in more detail, and the entire set-up was designed to create the maximum of interest. Both species are deadly, but while the first prefers to get out of the way, the Funnel-web is described as very pugnacious.

Mr. W. Leach's Australian timbers and display-board of the seeds and fruits of various Australian plants added variety to the show, while maintaining the high standard shown throughout the exhibits.

Several members combined to provide the effective exhibits of garden-grown native plants. Bowls of Black and Red-stemmed Green Kangaroo-paws, Esperance Wax-flower, red and mauve bottle-brushes, many tea-trees (including one of the most beautiful displays in the show), the Round-leaf Tea-tree, Mount Barten Grevillea and many other fine species added to the colour and excellence of the flower exhibits.

Mr. Reeves's outstanding coloured photographs were shown to advantage on the dividing screens, and the large number of water-colours by Mr. Haase not only occupied much space on the screens but covered much of the wall space which would otherwise have remained rather bare. These water-colours were originally executed for the very worthy objective of interesting New Australians in our native flowers and birds.

Posters from the Australian National Publicity Association and the National Safety Council, with Black Cockatoos, aboriginal weapons and native animals as their motifs, attracted much attention.

The attendance throughout the show was quite good, but it was not until after the procession on the Wednesday night that the crowd really started to pour in. Although it must have been difficult for many of the people to obtain a proper view, the large attendance on this night was very encouraging to those who devoted a large amount of time to organizing the show.

It is a matter for regret that because of the limited accommodation in the small room, only one or two schools were invited to send parties of students. This is something which must receive special attention on the occasion of any future show.

The Club gives its sincere thanks to the excellent team of workers who helped to set up the show, to those who gave readily of their time to supervise during various sessions, and to the workers who dismantled the show with such efficiency.

It is difficult to single out individual efforts, but the valuable work of Messrs. Satorich, Hooke, Swaby and the Wallaces should be placed on record.

PROPOSED EXCURSION TO MALLACOOTA

Would those interested in a motor-car excursion to Mallacoota (Boxing Day to New Year's Day next, inclusive), please contact the leader, Mr. N. A. Wakefield *at or before the June General Meeting*, because preliminary arrangements must be made immediately. (Phone UJ 8440).

BUNJIL'S CAVE FOUND

By A. MASSOLA*

Bunjil, or Pund-jel, the All-Father, was known and venerated by all the tribes of north-western and central Victoria. He was known to tribes outside this territory, but by other names: Baiame, Daramulum, Mungan-ngana, etc. Everywhere he was known as a Good Spirit, who never harmed man or beast. It was he, in fact, who created things as they are today and who gave the tribes their law and culture.

The aborigines of the Yarra Tribe, the Wurunjerri, believed that Bunjil warmed the sun, and the sun warmed the earth, which opened, and the black fellows came out. Bunjil had two wives, and gave one of them to his brother. He also had two sons, whose duty it was to destroy wicked people. Bunjil, they believed, has gone to the sky and is now a star. Howitt quotes Berak, the last "king" of the Yarra Tribe, as saying that he was taken, as a boy, outside the camp by his mother's brother, who, pointing to the star Altair, said "See, that one is Bunjil; you see him and he sees you." This was before Batman's time. This tribe, in common with all the others forming the Kulin "nation" was divided into two classes, the Eagle-hawk and Crow. Bunjil was the Eagle-hawk.

Dawson mentions him as the Good Spirit of the tribes of south-western Victoria, but calls him Pirnmieheal. He did good to man and beast by bringing rain and making grass and roots grow for their benefit.

In north-western Victoria, amongst the Wotjohaluks, Bunjil was a great man. His wives were two sisters, Ganawarra, the Black Swans. His brother's name was Djurt. Bunjil is now in the sky as the star Fomalhaut.

As can well be imagined Bunjil was also credited with making the natural features of the land. Various caves were connected with him. One about two miles east of Bushy Creek, was said by the local Wurunjerri to have been made by him when in anger. Some of the aborigines had done something which displeased him, and he caused a star to fall and make this particular chasm. Another, at Cape Schanck, was made by him and he much delighted in it.

Howitt, in his *The Native Tribes of South-east Australia* (1904), mentions one cave connected with Bunjil in a more direct way. He writes: "All that I know of the beliefs of the Mukjarawaint is that Bunjil was once a man who was the father of all the people, and that he was good, and did no harm to anyone. I may mention here as in one sense belonging to this part of my subject, that one of the Mukjarawaint said that at one time there was a figure of Bunjil

* Curator of Anthropology, National Museum of Victoria.

and his dog painted in a small cave behind a large rock in the Black Range near Stawell, but I have not seen it, nor have I heard of anyone having seen it."

Naturally, this cave has been long sought, as the importance of it has always been realized. But it was not found. It is probable that at times the wrong locality was searched. A. S. Kenyon, for instance, wrote the following in the *Ararat Advertiser*, of April 11, 1929: "Dr. A. W. Howitt was told by a black fellow at Tyers that in the Black Range, the range west of the Glenelg, there was a cave with a painting of Baiamai, the Great Spirit. Search has been made for this without result."

Bunjil's cave has been found at last! Mr. I. R. McCann of Stawell, informed me that Mrs. W. A. Collins, the energetic secretary of the local Field Naturalists Club, had "run the quarry to earth". After persistent inquiries, Mrs. Collins has ascertained that the locality of the cave had been known to some of the local people for years. Soon after receiving this news, I was on the spot, in the company of Mrs. Collins and Mr. McCann.

The cave is situated in an elevated position, on the western flank of the Black Range and overlooking Lake Lonsdale in the distance. One might say it is in the shadow of the Grampians, though that range is about twelve miles distant. The slope upon which the cave is situated is dotted with numerous large granitic boulders and sparsely timbered with Yellow Box, Long-leaf Box, and at intervals occasional She-oaks and Black Wattles.

On the south side of one of these gigantic boulders is a cave-like hollow, almost a crypt, five feet high, seven feet wide, and six feet six inches deep. The ceiling is dome-like, the floor is composed of granitic gravel, and the back wall is quite smooth and perpendicular.

On this wall is painted the strangest imaginable figure. At first glance it does not appear to be genuine, as it seems to be traced in white paint and is quite unlike the work of aborigines. It is the figure of a fat man sitting on his haunches, Buddha-like, 43 inches



Boulder showing the cave.

high and 4 feet 7 inches wide. On the right of this figure are two dogs (which also give the appearance of having been traced), one, facing Bunjil, 13 inches long, and the other 11 inches.

The figure of Bunjil has some extraordinary looking dots down the centre, epaulette-like projections over the shoulders, and stripes on the arms. These dots, epaulettes and stripes, are painted white. The face has two eyes, a stroke for a nose and an upward slanting



Bunjil and his two dogs.

curve for a mouth. These are in red ochre, but almost obliterated. Also there are two prominent white dots on the right side of the face, suggestive of two eyes, one below the other. The whole looks unreal, but on closer examination one must arrive at these conclusions:

The figures were originally painted in red ochre, not the outlines only, but the whole in solid colours, like all the other known figures of aboriginal workmanship. Only Bunjil's head seems to have been left uncoloured, possibly to show the features of the face. Only one dog was painted, also in red. At a later date someone, possibly shepherds, lit fires in this cave, very likely while sheltering from the rain. This soon covered the walls with a thick coating of soot, and almost obliterated the painted figures. Later again, the natives (I see no reason why anyone else would want to do it) picked out the details of Bunjil and his dog in white pipeclay added a second dog and gave Bunjil a tunic-like jacket conforming to the soldiers'

uniforms of the last century. Had Europeans done this they naturally would have used European paint.

I have said earlier that the cave had been known to local people for many years; the proof is on the rock itself. On the right-hand side of the entrance to the cave there is a large inscription in red paint, European paint, not red ochre. It reads: "ALL THIS WONDERLAND", and underneath are two names, "H. STANTON" and "E. ROBSON". Then comes "MANCAVE", underneath again the date, "25/1/11", and finally "H. STANTON" once more. Now Robson, I am told, is the man to whom the land was originally leased. It has now reverted back to the Crown, which is just as well, because it will make it easier to have this cave protected by a wire enclosure. Mr. W. Holmes, who has owned land adjoining it for 34 years, said the cave has always been known to his family and the painting was always as it is now. The district itself was well frequented by the natives. They had a permanent camp within five miles of this spot. Food, of course, was plentiful, and so was water. Innumerable springs dot the hill-side, one within a few hundred yards of the cave. Mr. Holmes has ploughed up a number of stone axes and other implements on his land.

There can be no doubt about this being the cave mentioned by Howitt, as the description fits it perfectly. It is by far the most important site so far reported from Victoria, important, because we know who the figure painted on the wall represents. While possibly not the most interesting pictorially, it is nevertheless full of interest, as the repainting of the outline of figures is not known from any other painted site. The outline, as far as can be seen, seems to follow the edges of the original painting very closely, also the white button-like dots must have been added at this time. They could not have been in the original red ochre version, otherwise the eyes, nose and mouth would have been white also. Moreover, it was not the habit of the aborigines, at least in Victoria, to use two colours on the one figure.

The National Museum is indeed grateful to Mrs. Collins and the members of the Stawell Field Naturalists Club for this fine discovery. It is the third painted site reported by this vigorous body, and it demonstrates the valuable work that can be done by enthusiastic field naturalists.

MICROSCOPICAL GROUP

Mr. C. Nance was the lecturer at the May meeting, his subject being "The Cutting, Staining and Mounting of Botanical Sections". Mr. C. Middleton rounded off this well-prepared demonstration by projecting several slides of Mr. Nance's own specimens on his micro-projector.

Members are requested to bring their "mikes" to the next meeting on June 19th, as Mr. H. Barrett will be giving one of his very interesting talks on "Diatoms" and there will be numerous slides to demonstrate.

SYSTEMATIC NOTES ON VICTORIAN MOSES—6

By J. H. Willis*

SUMMARY

In this paper the following seven items are involved: 1. Synonymy of *Ditrichum elongatum* (Hook. f. & Wils.) Mitt. under *D. cylindricarpum* (C. Muell.) Mitt. 2. Indication that the Victorian record of *Ditrichum calcareum* (R. Br. ter.) Broth. is dubious. 3. Synonymy of *Acadon apiculatum* Jaeg. under *A. integrifolium* C. Muell., with transference of the varietal epithet *aristatum* from the former to the latter name. 4. Establishment of *Phaeum molle* C. Muell. as a synonym under *Pottia drummondii* (Wils.) J. H. Willis, var. *obscura* J. H. Willis. 5. Recording of *Cryptaea tasmanica* Mitt. ex Wils. as new to the Australian mainland. 6. Treatment (following G. O. K. Sainsbury) of *Triquetrella curvifolia* Dix. & Sainsb. as a synonym of *Autodontos tosmanicus* Broth.—name of a barren plant, at present presumed referable to Thuidiaceae. 7. Recognition of the genera *Lapidum* Hook. f. & Wils. (Hypopterygiaceae) and *Eurhynchium* Bruch & Schimp. (Brachytheciaceae) in the Victorian moss flora.

Ditrichaceae

1. *DITRICHUM CYLINDRICARPUM* (C. Muell.) Mitt. in *Trans. & Proc. roy. Soc. Vict.* 19: 51 (1883).
D. elongatum (Hook. f. & Wils.) Mitt. in *Trans. & Proc. roy. Soc. Vict.* 19: 51 (1883);
Trichostomum elongatum Hook. f. & Wils. in Hook. f. *Flora Tasm.* 2: 176 (1858);
T. cylindricarpum (C. Muell.) Wils. in Hook. f. *Flora Tasm.* 2: 177 (1858);
Leptotrichum cylindricarpum C. Muell. in *Bot. Zeit.* 9: 531 (1851).

It is unfortunate that such a well-known name as *Ditrichum elongatum* for a common Australasian (and South American) moss should have to be discarded; but, after assessing the available evidence, I am convinced of the synonymy set out above. In J. D. Hooker's *Flora Tasmaniae* Vol. 2 (1858) are published Latin diagnoses of *Trichostomum elongatum* sp. nov. (p. 176) and *T. cylindricarpum* comb. nov. (p. 177). Types of both came from Tasmania and, except that the former is described as *monoicum* and the latter as *dioticum*, the two descriptions show no disparity whatever and refer, almost certainly, to one and the same taxon. It is doubtful whether C. Mueller's type of *Leptotrichum cylindricarpum* (from rocks at the Cataract Gorge near Launceston—leg. Mossman) is still in existence, and until it can be found one's knowledge of the species must rest upon his description alone.

W. Mitten [*Trans. & Proc. roy. Soc. Vict.* 19: 51 (1883)] was the first to refer *cylindricarpum* and *elongatum* to their correct genus, *Ditrichum*, but the former epithet is misspelt "cylindrocarpum" in Mitten's paper and the page of the original description is given as 351 instead of 551—probably typographical errors. L. Rodway [*Papers & Proc. roy. Soc. Tas.* for 1912-91 (1913)], having decided that these two Tasmanian entities were conspecific, reduced *Trichostomum cylindricarpum* (C. Muell.) Wils. to synonymy under *Ditrichum elongatum* (Hook. f. & Wils.) Mitt.; the procedure, however, should have been reversed. A Gehreb has correctly determined as *D. cylindricarpum* an undoubted Grampians (Vic.) specimen of *D. elongatum* in the Melbourne Herbarium.

* National Herbarium of Victoria

2. *DISTRICHUM CALCAREUM* (R. Br. *ter*) Broth., 1901.

This very rare New Zealand moss (type from damp limestone rock at Castle Hill, Canterbury) is recorded for Victoria by H. N. Dixon [Bull. N.Z. Inst., No. 3, 47 (1914)] on the basis of *Leptotrichum subbrachycarpum* C. Muell., 1898, from the Grampians (leg. Sullivan). Dixon had examined type material of the latter, but without fruit, and found it "quite identical with R. Brown's plant, so far as the vegetative characters go". If Dixon's pronouncement be correct, the disjunctions in habitat and occurrence (southern New Zealand and western Victoria) are most remarkable; but, in this highly critical group, one is on dangerous ground without fruiting capsules in good condition, and I would prefer to treat *D. calcareum* as a very dubious record as far as Victoria is concerned. In G. O. K. Sainsbury's recent handbook on the moss flora of New Zealand, the description of *D. calcareum* covers also *D. rufo-aureum* (Hampe) J. H. Willis, to which species the Rock and Pillar Range occurrence belongs [see discussion by writer in *Vict. Nat.* 72, 7-8 (May 1955)].

Pottiaceae

3. *ACARDON INTEGRIFOLIUM* C. Muell. in Bot. Zeit. 13: 745 (1855).
 - A. apiculatum* Jaeg. Musc. Clerst.: 20 (1869);
Phascum apiculatum Hook. f. & Wils. in Hook. f., Flora N.Z. 2: 58, T. 83 fig. 1 (1854), nom. *P. apiculatum* Bridel Musc. Recens. Suppl. in seu Mitt. Gen. Spec. Musc. Fruend. Untergras. 8 (1819).
 - A. INTEGRIFOLIUM* C. Muell. var. *ARISTATUM* (J. H. Willis) comb. nov.
A. apiculatum Jaeg., var. *cristatum* J. H. Willis in Vict. Nat. 70: 170 (Jan. 1954).

I have been kindly informed (private communication) by Professor Dr. R. van der Wijk of Groningen, Holland, that the name *Phascum apiculatum* Hook. f. & Wils. (1854) is antedated by *P. apiculatum* Bridel (1819) and is therefore illegitimate, as a later homonym. S. E. Bridel's description in the old German publication (at Gotha) was based on English material—later referred to *Phascum cuspidatum* Hedw., var. *piliforme* (Hedw.) Hook & Tayl.—and it had been completely overlooked by later compilers of moss catalogues and indices, including the standard works of E. G. Paris. This means that the specific epithet in *Acardon apiculatum* Jaeg. is to be treated as new, dating from 1869, not as a transference of Hooker and Wilson's 1854 epithet. Thus, *A. apiculatum* is a more recent name than *A. integrifolium* C. Muell. (based on the same taxon) and, according to the International Code of Botanical Nomenclature, the latter must take precedence.

The change of specific name necessitates also a new combination for my variety *aristatum* (originally attached to *Acardon apiculatum*), and this is effected above. The remaining synonyms of *A. integrifolium* are *A. turgidum* (Mitt. ex Wils.) Mitt., *A. sullivanii* C. Muell. and *A. austro-mixtum* Geheeb in Roth—as set out already in *Vict. Nat.* 70: 169 (Jan. 1954). On the same page of the journal I mentioned "*A. crassumervium* Broth. (nomen nudum?)" from New South Wales; Professor van der Wijk assures me that the name was actually published with a description by C. Mueller in Hedwigia 41: 119 (1902).

4. *POTLIA DRUMMONDII* (Wils.) J. H. Willis var. *OBSCURA* J. H. Willis in Vict. Nat. 70: 171 (Jan. 1954).
Phascum molle C. Muell. in Hedwigia 41: 119 (1902).

This new varietal epithet was based upon the type of "*Phascum molle*" C. Muell. (from Dunthoola Vic.), which I thought to be a manuscript name. Professor van der Wijk again advises that my assumption was incorrect,

pointing out the place where Mueller's new species was validly published. So, in effect, *Pottia drummondii* var. *obscura* becomes a change in rank and epithet, with *Phascum molle* as a straight synonym.

Cryptaeaceae

5. *CRYPTEA TASMANICA* Mitt. ex Wils., 1858. Upper Jamieson River, Vic.—on wet boulders at water's edge in gorge tract of northern branch, ca. $\frac{1}{2}$ mile above Wren's Flat (J. H. Willis, Feb. 1949); Green's Creek waterfall, ca. 3 miles N.E. of Bogong township, Vic.—on granodiorite rocks permanently splashed with water (C. B. Kay, Nov. 1956).

This constitutes the first record of the species for the Australian mainland, and it is apparently very rare (or overlooked) in Tasmania, being known there only from the type locality of Jacky's Creek—an upper tributary of the Meander River. Otherwise, according to G. O. K. Sainsbury, it is "widespread" in New Zealand. Both Victorian collections are barren, but from the robustness and semi-aquatic habitat there can be little doubt concerning their identity. When in fruit, *C. tasmanica* may be distinguished from its corticolous ally, *C. dilatata*, by having well-developed peristome teeth (about 0.4 mm. long).

Thuidiaceae

6. *ANOMODON TASMANICUS* Broth. in Öfver. Finska Vet.-Soc. Förh. 42: 137 (1899).

Triquetrella curvifolia Dixon & Sainsbury in J. Bot., Lond. 71: 217, T. 28 fig. 3 (Aug. 1933).

H. N. Dixon was convinced that this plant belonged to the genus *Triquetrella* (family *Pottiaceae*). However, Mr. Sainsbury states that the type of *T. curvifolia* is identical with that of *Anomodon tasmanicus* Broth. from Mt. Knocklofty, Tas.—a name ignored in J. Rodway's published revisions of Tasmanian mosses—and his attitude is expressed as follows: ["Handbook of N.Z. Mosses", Bull. Roy. Soc. N.Z., No. 5: 474 (1955)]:

Its generic position can scarcely be considered as established in the absence of fruit, but I think that it is probably an *Anomodon*.

The inability of competent bryologists to decide whether a barren moss belongs to the *Pottiaceae* or *Thuidiaceae* (which are poles apart systematically) is astonishing! At present, *Anomodon tasmanicus* is known only from five widely dispersed localities—Havelock (on Hawke's Bay) and Otago in New Zealand, the type area of Mt. Knocklofty in Tasmania, Castlemaine (Vic.) and Torrens Gorge (S. Aust.). The single Victorian collection, made by F. Robbins (Apr. 1943), was recorded in Vict. Nat. 63: 222 (Feb. 1947) as *Triquetrella curvifolia*.

Hypopterygiaceae—Brachytheciaceae

7. *LOPIDIUM CONCINNUM* Hook. f. & Wils., and *EURHYNCHIUM ASTRINUM* (Hook. f. & Wils.) Jaeg.

These names have been recently adopted, with convincing arguments, by Mr. Sainsbury ["Handbook of N.Z. Mosses" I, pp. 408 & 447 resp. (1955)], and the species concerned are also present in Victoria. Mr. H. T. Clifford, in collaboration with the writer [Vict. Nat. 68: 157 (Dec. 1951)], had merged *Lopidium* with *Hypopterygium* and referred *Eurhynchium austrinum* [syn. *Oxyrrhynchium austrinum*] to the genus *Platyhypnidium* Fleisch. (Amblystegiaceae), following Dixon (1927) in the former case and Brotherus (1924) in the latter. It is now necessary to add both *Lopidium* Hook. f. & Wils. and *Eurhynchium* Bruch, Schimp. & Grimp. to the list of Victorian moss genera and to delete *Platyhypnidium*.

EASTER EXCURSION, 1957, WITH THE WIMMERA FIELD NATURALISTS CLUB

By M. J. LESTER

The twenty-one Melbourne members were met at Dimboola on Thursday night, April 18, by Mr. Muir, secretary of the Wimmera Club and were guided to our two hotels.

On Friday morning, members of the Wimmera Club arrived with cars and utilities into which we were comfortably stowed. They took us west to Kiata and then south to the Kiata Lowan Sanctuary on the edge of the Little Desert. Here the cars were parked and we all transferred to a large truck.

The Little Desert

After passing through a farm property where there were some superb Yellow Gums (*Eucalyptus leucoxylon*), the truck followed a sandy track, or sometimes no track at all, into the Little Desert. Seated on bags of wheat in two rows, back to back down the centre of the truck, we all had an unimpeded view when some kangaroos came bounding through the scrub. We continued for several miles in the Desert to a salt lake where we stopped for lunch.

The name "desert" greatly maligns the locality, for it is completely covered with scrubby vegetation, ranging in height up to six feet, and with intermittent clumps of Mallee Gums up to 10 or 15 feet high. Six hundred species of plants have been listed for this so-called desert!

Apart from the she-oaks and mallees (many of each being in bloom—if "bloom" is a term one can apply to eucalyptus!), the most conspicuous flowers were the banksias—masses of *B. ornata* covered with their creamy spikes, and lesser quantities of the smaller, more golden-flowered Silver Banksia (*B. marginata*). There were clumps of Common Correa (*C. reflexa*) ablaze with green-tipped crimson bells, and sprinklings of bluebells (*Wahlenbergia*) and yellow guinea-flowers. These could not be missed as we passed in the truck, but more flowers were discovered when we stopped—some beard-heaths Cranberry Heath (*Astroloma humifusum*), Flame Heath (*Astrolobium conostephoides*), Slackhonia, *Pimelea spathulata*, *Lomandra* and grass-trees. Near the shore of the lake was a dense, bushy *Melaleuca* (not in bloom) and two or three fine Yellow Gums.

On going down to the shores of the lake, we found that it was not a lake of salt water but of salt—salt, a quarter of an inch thick with black mud below. The smooth, gleaming whiteness of its surface was broken by the tracks of an emu.

Kiata Lowan Sanctuary

After lunch we returned to the parked cars in the sanctuary, and Mr. Hately led us to a nesting mound of the Lowan or Mallee Fowl. The mound of sand was about ten feet across, about three feet high and was hollowed in the centre. The nesting season was over so the mound was no longer in use, but, digging gently in the depressed centre of the mound, Mr. Hately unearthed two eggs, each about three inches long. One, Mr. Hately declared, was addled, and he doubted if the other would hatch so late in the season, but he replaced them both, larger end up as he had found them. Mr. Hately, who has spent weeks in a hide-out near a nesting mound, gave us a most interesting account of the Lowan's life and habits. Later, he took us to a larger nest that has been recorded as being in regular use since 1903 and, that evening, we saw the remarkable photographs he has taken of the Lowan at the mound.

Returning again to the parked cars, we found a most sumptuous afternoon tea awaiting us. Before going back to Dimboola we had only a short time in which to note the differences between the vegetation in the sanctuary and that of the Little Desert proper. Here was a small *Acacia*, grown in some quantity, but it is very localized in its distribution and is uncommon elsewhere; there were Murray Pines (*Callitris*), another *Melaleuca* and Brush Heath (*Brachyloma ericoides*).

In the evening, after a hurried meal, we all went to the general meeting of the Wimmera Club at the shire hall in Dimboola. When the Club's business was completed, Mr. Hanks showed slides and gave an address on the beauties of our gum trees. Supper concluded the meeting.

North-western Grampians

On Saturday the Wimmera cars assembled again and took us to Mt. Difficult at the north-western edge of the Grampians. We were delighted with the number of plants which were in flower, everything that was in the desert was there—bigger, better and a lot more besides. As well as the banksias, guinea-flowers, beard heaths, etc., there were two species of *Leptospermum* in bloom, lots of little bushes of the bright green Pine Heath (*Astrolobium pinifolium*) with its yellow, green-tipped upright bells, *Baeckea crassifolia* with many tiny, lavender-pink flowers, *Eucalyptus impressa*, the green-helmed *Correa aenula*, Autumn Greenhood (*Pterostylis revoluta*), *Cuprosina*, Golden Everlasting, *Lecidea*, and a few flowers on the many bushes of *Thryptomene*. By comparison, we began to think that the Little Desert is a little desertish!

In the afternoon our cars took a meandering route through the bush southwards to some aboriginal drawings. The drawings are in the shelter of overhanging rocks, and the government has erected a high wire-netting fence to protect them from vandals.

That evening we were invited to the home of Mr and Mrs. Muir in Dimboola. We admired Mr. Muir's begonias (and the extensive hot-houses he has built), then returned to the house to see the slides of his South Australian trip and those of Mr. Haase of various spots in New South Wales and Victoria. Supper concluded another full day.

Mount Arapiles

On Sunday morning we set out for Mt. Arapiles, about 20 miles west of Horsham. It is of sandstone formation similar to that of the Grampians, which has a steep, rugged eastern face which, rising sharply from the plain, makes this range look much higher than it really is.

First we were taken to a spot at the foot of the mountain where there were many bushes of Fairy Waxflower (*Eriostemon australis*), unfortunately with very few blooms as yet. At this rather rocky spot, to turn over a stone meant the revealing of a scorpion or some large flat spiders, and right among the rocks was a large *Casuarina* bearing both male and female flowers. Nearby were many fair-sized trees of Golden Wattle with strangely pale blossom.

The cars then climbed a winding, narrow track among more pale-flowered Golden Wattles, past low clumps of Cranberry Heath growing on pebbly parts near the track (the numerous scarlet flowers less hidden by foliage than usual), to the parking space just below the fire-watchers' look-out on the top of Mt. Arapiles. Here were more wax-flowers and clumps of the Round-leaf Mint-bush (*Pristanthera rotundifolia*) with just a few lilac blooms.

Mitre Rock

In the afternoon we left Mt. Arapiles for Mitre Rock, a precipitous little fragment which we had observed from the look-out. Mr. Muir led us to his

"find"—the Skeleton Fork-fern, hanging from cracks in the north face of the Rock. Some of the plants were a foot or more long, of a greyish colour except the branched ends which were quite a bright orange. Most of the plants were safely beyond the reach of any but a mountaineer, so this descendant from a primitive group should survive for some time.

On the Rock we found our first specimen of Weeping Pittosporum (*P. phillyreoides*) ; it was in fruit.

That evening we returned to Horsham to see the flower slides of Mr. Croaker. He showed some splendid close-up shots of orchids, especially of the varying form of the columns. Mr. Haase followed with views of Tasmania. Like the other days, this one ended with a very good supper.

On Monday, members divided their interests. Some went to the Wail Nursery to see the many native plants that are cultivated there, and others wandered along the Wimmera River which is fringed with picturesque old River Red Gums. Regretfully we left Dimboola soon after noon.

I would like to express here our appreciation of all that the members of the Wimmera Club did for us: at what must have been considerable expense to themselves they provided transport throughout the week-end, they took us off the beaten track to places we could never have known without them, they passed on to us their combined knowledge of the nature lore of the locality, and they were hospitable to the extreme. We are very grateful for all their kindnesses and wish the Wimmera Club and its members continued enjoyment of the natural wealth amongst which they live.

EXCURSION REPORT. LAL LAL AND MOORABOOL FALLS

Thirty-one members and friends took part in the excursion to the Lal Lal and Moorabool Falls to the south-east of Ballarat on Sunday, March 24. The trip was mainly of interest because of the respective gorges which have been cut by the two streams through the Newer Basalt deposits. The water tumbles over solid basalt rocks into these gorges in almost vertical drops of from forty to fifty feet deep. The gorges are filled with picturesque white gums which surprise and please the visitor by their beauty and unexpected presence in what is otherwise an area devoid of special interest.

Before reaching the Lal Lal Falls the party inspected a recent kaolin quarry where the quartz crystals mixed with the white clay indicated a granitic deposit. These granitic rocks were also uncovered where the stream had cut down to bedrock at the foot of the Moorabool Falls.

The falls are located respectively on the Lal Lal Creek and the western branch of the Moorabool River. (See Ballan sheet of Military Survey.) In parts, exploration demanded progress over the broken sides and bases of the gorges and the leader feels he has earned a bad reputation for "scrub shoving". Those who ventured up to the Moorabool Falls (the Lal Lal Falls are easily accessible) were rewarded by vantage points on the far side from which to view the actual drop over which a considerable amount of water was flowing for this time of the year.

On the return journey a trip was made to the look-out on Mt. Buninyong where the recently improved road enabled the bus to reach the top. The view over the whole of the Ballarat district was much appreciated.

Bird lovers remarked on the absence of much bird life except for a flock of ibises in the paddocks near Lal Lal. Botanists may have found the trip lacking in interest, but the white gums on the roads and gorges probably satisfied the tree lovers.

—R. G. HEMMIE.

RE THE SUNBURY MOUND

[In *Vict. Nat.* 73: 67 (Sept. 1956), A. A. Brunton published an article entitled "An Aboriginal Burial Mound". This was followed in *Vict. Nat.* 73: 112 (Nov. 1956) by a letter from D. A. Casey in which he reported that his examination of the formation concerned suggested that it was a natural feature. The *Victorian Naturalist* will not become the medium for a lengthy controversy on this point, though any new data pertaining to it will be considered for publication. A further statement has been received by us from Mr. Brunton, and of it the following major part is presented for readers' consideration.—Editor.]

In *Vict. Nat.* 73: 112 (Nov. 1956), D. A. Casey indicates that the aborigines never raised mounds over their dead. This is contrary to the views of an early explorer.

In *Three Expeditions into the Interior of Eastern Australia*, ed. 1 (1838), p. 52, Major Mitchell wrote:

"April 24. On this flat we passed a newly raised tumulus, a remarkable circumstance, considering the situation, for I had observed that the natives of the Darling always selected the higher ground for burying in; and it might be presumed, that, on this part of the Lachlan, the tribe (whose marks were numerous on the trees) could find no heights within their territory."

And on p. 53 the Major says: "It struck me that this gluton which they call Bâyan, must be the 'staff of life' to the tribes inhabiting these morasses, where tumuli and other traces of human beings were more abundant than at any other part of the Lachlan that I had visited."

Then in *The Aborigines of Victoria* 1: 105, Brough Smyth says: "The grave is finally completed by raising over it a mound of earth, which is generally twelve or eighteen inches in height, and about nine yards in length, and six yards in width."

On p. 110 there is an account of a burial by the Lower Murray blacks which was witnessed by Mr. T. M. Hughan in 1851. He says: "On the death of an aged head man of a tribe, there gathered together near the grave very many mourners. The women, as is customary, burnt themselves with firesticks, and howled distantly; and all the proper rites having been performed around the grave, which was dug in a sandhill having a gentle slope towards the bank of the Tarn Creek, a mound was finally raised and smoothly coated with wet clay. Around the mound a circle of spears was formed, and by each spear sat a warrior. Another set of less prominent men sat in a circle, each by his spear. Around these, and at a little distance, and sitting further apart, the women formed an outer circle. Not a sound was heard from the mourners. Sadly and patiently they awaited an event which was to be caused by the fierce sun overhead. The heat was oppressive, but no motion arose in the circles. At length the clay which covered the grave cracked. The old men drew nigh, and having ascertained the direction of the first main fissure in the drying clay, they indicated the path which the warriors were to take in order to find the person who had practised sorcery on their deceased relative. There, as elsewhere, it was the duty of the avengers to bring back the kidney of the first man of another tribe whom they might meet."

—A. A. BRUNTON.

BOOK REVIEW: "BIRD WONDERS OF AUSTRALIA"

It was in 1936 that I first read and enjoyed A. H. Chisholm's *Bird Wonders of Australia*. The book, written in his engaging style, was packed with bird lore of a kind of which few of us less enterprising field naturalists would have been aware had it not been gathered together into one wholly entertaining and instructive book.

Although I am scarcely a "birdman", my enjoyment of the book was of a kind confessed to by Keats when he first looked into Chapman's "Homer". The book still has a place on my shelves, although the 1956 edition tempts me to substitute it for the less pretentious first edition. The fourth is well printed, nicely bound and generously illustrated. The one colour plate of the harlequin-plumaged Pitta, photographed by Ellis McNamara, has special point as an adornment, for it is of a bird that few have seen, and even fewer would have the industry, patience and good fortune to catch it in colour.

This new edition treats at greater length of topics which, in the thirties, were ornithological news but, in the re-telling, they have lost nothing of their interest, the more so because, since those days, the fund of bird lore has been constantly augmented and an abundance of the new knowledge has found its way into the 1956 book.

Yes, it is a book the field naturalist would be glad to possess, and others not so inclined would be well pleased to read.

Our copy from the publishers, Angus & Robertson, Sydney, 236 pages, plus a 5-page index. The price, 27/6

—J. RUS. GARNET.

WHAT, WHERE, AND WHEN

F.N.C.V. Meetings:

Monday, June 10—Presidential Address and Annual Reports.

Monday, July 8—"Snowy River Valley, Victoria", by N. A. Wakefield. Illustrated with colour slides.

Monday, August 12—Members' Photographic Night. Members are invited to submit and give lectures on short series of slides pertaining to natural history. Sets of slides should be in the hands of Mr. F. Curtis (11 Monomeith Avenue, Toorak, S.E.2) as soon as possible for selection.

F.N.C.V. Excursions:

Saturday, June 22—The Botany Group will hold a winter ramble through the Botanic Gardens. Meet 2.30 p.m. at gate nearest Herbarium.

Sunday, July 7—Lyrbird excursion to Sherbrooke. Leader: Miss Tina Watson. Take 8.55 a.m. train to Upper Ferntree Gully then bus to Kallista. Bring one meal and a snack.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated).

Wednesday, June 19—Microscopical Group. Speaker: Mr. Barrett. Subject: The Diatoms of Port Phillip Bay.

Saturday, June 29—The Botany Group will meet at 2.30 p.m. in Mr. Lord's room at 514 Little Collins Street (between King and William Streets). Speaker: Mr. A. J. Swaby. Subject: Ferns.

Monday, July 1—Entomology and Marine Biology Group. The meeting will be in Mr. Strong's rooms in Parliament House at 8 p.m. Enter through private entrance at south end of Parliament House.

Wednesday, July 3—Geology Group. Subject: Ice Ages. Speaker: Mr. R. Hemmy.

Preliminary Notice:

Friday, July 12—Special Entomology excursion to the Museum. Mr. A. N. Burns, Curator of Insects, will be in charge of the party. Meet 7.45 p.m. at the main Russell Street entrance.

MARIE ALLENOR, Excursions Secretary
19 Hawthorn Avenue, Caulfield, S.E.7

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PROCEEDINGS

About 80 members and friends attended the Annual General Meeting held at the National Herbarium on June 10, 1957. The retiring President, Mr. A. J. Swaby, chaired the meeting.

The President gave a short address in which he stressed the need for greater scientific activity, and outlined a scheme for a sub-committee of experts to inspire research and assist in its advancement. He indicated that as an *ex officio* member of Council, he would attempt to launch this scheme during the ensuing year.

The seventy-seventh Annual Report of the Club was read by the Secretary, and the Treasurer's Report was presented by Mr. Evans on behalf of Mr. Hooke. Consideration of the latter report was adjourned until this coming meeting to enable members to study it in print. Both reports are published in this issue, together with comments on the finances of the Club.

Since there were no excess nominations for office-bearers for the year 1957-8, no election was held and the following were appointed to the various offices: Drs. R. M. Wishart and W. Geroe, Vice-Presidents; Mr. E. H. Coghill, Honorary Secretary, Mrs. F. Curtis, Honorary Assistant Secretary; Mr. A. G. Hooke, Honorary Treasurer; Miss M. Butchart, Honorary Assistant Treasurer; Mr. A. B. Court, Honorary Editor; Mr. N. A. Wakefield, Honorary Assistant Editor; Mr. A. Burke, Honorary Librarian; Mr. Allen, Honorary Assistant Librarian; Miss M. Allender, Honorary Excursions Secretary; and Miss M. Elder, and Messrs. J. R. Garnet, F. Curtis, D. McInnes and H. Haase, Council members. Mr. W. L. Williams who was the only nominee for the office of President, declined the position. The matter reverted to the Council in accordance with the Articles of Association and at a Special Meeting held after the General Meeting, Mr. J. R. Garnet was elected to that office. Mr. R. B. Jennison, who was nominated as a member of the Council, declined office, and the election of Mr. Garnet to the office of President left a vacancy on the Council which it is hoped to fill at the next meeting. Mr. Evans was reappointed as Honorary Auditor.

The following were elected as members of the Club: Mr. W. J. L. McCully, Glen Iris (Ordinary); Mr. R. P. Dixon, North Balwyn (Ordinary); Miss G. M. Davies, Dimboola (Country); Thomas G. Lawler, Porepunkah (Junior).

Miss M. Elder moved that the Annual Subscription be increased to £5, but this matter was adjourned until the next General Meeting because of the lateness of the hour. A summary of the memorandum presented by Miss Elder is given below.

Mr. Swaby mentioned that he had been informed that an excursion of some 700 miles through parts of the best wildflower country in Western Australia would be held during next spring. The inclusive cost from Perth to Perth would be £25.

Miss Woollard showed some very interesting slides of West Australian flora, especially *Stylidium* spp. (trigger plants). Some slides of the White-eared Honeyeater were shown by Mr. Frank Pincher.

SEVENTY-SEVENTH ANNUAL REPORT, 1956-7

During the year membership has declined slightly; there are now 309 Metropolitan, 150 Country, 19 Junior, 21 Honorary and 4 Life Members, making a total of 503 compared with 546 for last year. Honorary membership was conferred on the Treasurer, Mr. A. G. Hooke, the Editor, Mr. N. A. Wakefield, Mr. A. L. Scott and Mr. A. W. Jessep. Among members who passed away during the year were Rev. H. M. R. Rupp and Messrs. A. R. Henderson, F. Cudmore, F. Lewis and A. S. Chalk.

The Club adopted a policy of greater scientific activity and circulars were sent to kindred societies inviting them to affiliate with us and encouraging replies were received from them. In particular the Ballarat, Bendigo, Colac, Creswick and Wittenura Field Naturalists Clubs applied for affiliation and were accepted at the May General Meeting. In addition, the Beaumaris Tree Preservation Society enrolled as a subscriber to *The Victorian Naturalist*. The Gould League of Bird Lovers also enrolled and has expressed its desire to co-operate with us, and at present we are trying to arrange a joint exhibition during next year's Moomba Festival with them.

A long series of discussions on finance took place throughout the year, and the Club now has a General Fund, a Building Fund and a Publications Fund. It is hoped that this specialization of functions will lead to greater efficiency.

Many Club publications were sold during the year. The Education Department purchased a large number of copies of *Flora of Victoria and Tasmania* and the balance of *Victorian Toadstools and Mushrooms*. As more copies of the latter were required, a second edition was sent to press and this has now been published.

The Victorian Naturalist was published as usual. It was the medium for the publication of numerous articles dealing with systematic botany and many of these articles were financed by the Gibson Trust. They are intended as precursors for the forthcoming *Victorian flora*.

The Club has been fortunate in having a number of interesting lectures of high standard and our thanks are extended to the lecturers. An outstanding lecture was that of the retiring President,

Mr Tarlton Rayment, mentioned in last year's report. Among the other lectures presented were "Poisonous Australian Spiders" delivered by Dr. Weiner, "Antarctic Birds and Seals" (Mr. Becher-vaise), "Port Campbell Coast-line" (Dr. Baker), "Dolomites" (Dr. Christensen), and "Queensland Tropical Jungles" (Mrs. Messmer). Thanks are extended also to the many exhibitors who made Members' Night such a success.

During the year the Club held a nature show at the Prahran Town Hall, constructed a Nature Trail at the Colin Mackenzie Sanctuary, and took part in the wildflower display given by the Bank of New South Wales as well as supporting other functions. Our Past President, Mr. Tarlton Rayment, was largely responsible for the setting up of the wildflower display mentioned above.

The study groups remained very active during the year, and a new one was introduced into the Club—the Entomology and Marine Biology Group.

The members of the Microscopical Group report that they are a happy and industrious body. They have been led by Mr. McInnes with Mr. Snell as the Group Secretary and have shown how their speciality serves the botanist, geologist, zoologist, metallurgist and other scientists. They have also held discussions on the technical aspects of their own speciality.

The Geology Group, of which Mr. A. A. Baker is Secretary, continued to hold regular meetings and excursions. Mr. Baker reports that the Group finds colour photography an ideal method of portraying and holding interest in its studies.

Many interesting and informative subjects were discussed at Botany Group meetings during the year. Subjects discussed included "Carnivorous Plants", "Leaf-fall", "Plant Movement", "Acacias", "Dispersal of Fruits", "Plant Ecology", "Heathland Flora", "West Australian Wildflowers", and "Trees of the Port Phillip Area". The speakers on the above subjects were Mr. K. Atkins, Miss V. Baalam, Mr. Haase, Miss Dixon, and Mr. W. L. Williams. Mrs. Messmer was guest speaker at the February meeting at which she showed beautiful slides of native plants. The Botany Group lost the services of Mr. Atkins as Secretary and principal speaker, but Miss Dixon carried on the role of Secretary until Miss Allender took over this position.

Several meetings have already been held by the new Entomology and Marine Biology Group which meets in Mr. Strong's rooms in Parliament House. Excursions have been held to Sorrento and Seaholme, and Mrs. Freame's collection of Marine Biology articles has been inspected. Mr. Strong is acting as Secretary and leader of this group.

Thirty-one excursions have been held by the Club during the year and the average attendance has been about twenty members. Many

places of interest were visited and various phases of natural history were studied. Two big excursions were the highlights of the year. The first, during the first week-end in November, was to Bendigo at the invitation of the Bendigo F.N.C. Twenty-five members of our Club visited Eaglehawk, Sandy Creek and the Whipstick Scrub. The second big excursion was to Dimboola during Easter. Members of the Wimmera F.N.C. showed twenty-one of our members as much of the district as possible. They visited many places of interest, including Mount Arapiles, Mitre Rock, Little Desert, Salt Lake, the Lowan Sanctuary and the northern end of the Grampians.

There have been several changes in the Council since the last Annual Meeting. As foreshadowed at that meeting, Mr. E. H. Coghill accepted the post of Honorary Secretary. Mr. Curtis was accepted as a member of the Council. Mr. Wakefield resigned as Honorary Editor owing to pressure of personal business and his place was taken by Mr. A. B. Court, whom we wish well in his new office. However, Mr. Wakefield is acting as Honorary Assistant Editor. Mr. Atkins, who has rendered valuable service to the Club itself and to the Botany Group as Secretary, has found it necessary to relinquish his duties to further his studies. However, he will be continuing as Sales Officer. Mr. Lee, the Honorary Assistant Librarian, has found it necessary to withdraw from Council. He has rendered stirring service to the Club behind the scenes and will be missed very much.

Finally, before closing this report, sincere thanks are extended to those persons who made it possible for us to use the National Herbarium as our meeting place. We have approached the Trustees of the proposed Cultural Centre, seeking accommodation there when it is built, but without success. An approach is also being made to the Museum Trustees.

On behalf of the Council,

E. H. COGHILL, Hon. Secretary.

ANNUAL ACCOUNTS, 1956-7

GENERAL ACCOUNT. The total expenses for the year were £1,050 and income amounted to £1,012. This left a deficit of £38 for the year. Subscriptions, which came to £857, were £51 less than the previous year, and other items of ordinary income, totalling £35, were £12 less. However, this year there was a special donation of £120 from the M. M. Gibson Trust towards the cost of certain special issues of *The Victorian Naturalist*.

The Victorian Naturalist cost £921 to produce and this was £142 more than the previous year. This increase was due mainly to the cost of producing the special issues mentioned above.

Working expenses of £129 were £18 more than last year.

It will be necessary to exercise care during the present year to make ends meet, at least in the General Account.

BALANCE SHEET. I wish to mention the following points in connection with the Balance Sheet.

On the assets side, the principal items are the investments of the three special funds amounting to £2,084, including stocks of books now carried in the new Publications Fund, and the item covering the library, furniture and general equipment for £1,522. The balance in the General Account was £258.

On the Liabilities side, the Building Fund and the new Publications Fund now stand at £1,398 and £636 (including the value of the stock of publications) respectively. These amounts were determined at the May General Meeting.

The surplus of assets over liabilities now appears as a lower figure than before. This is due to the book stocks, which were shown previously as separate assets, and now held as part of the Publications Fund, following the resolution made at the May General Meeting.

FERN BOOK ACCOUNT AND FUNGI BOOK. The Fern Book Account shows a credit balance of £229 for the year, following sales of 1,688 copies of the book for £545. The Education Department ordered 1,440 copies and the other 248 were sold elsewhere. The remaining 2,841 copies now held are brought into account at cost. (£533).

The other major publication, *Victorian Toadstools and Mushrooms*, is not mentioned in the account themselves as the last copies of the old edition were sold during the year. The new (second) edition has just been published and is now available for distribution.

OTHER MATTERS. There are three other matters which I desire to mention.

1. An arrangement has been made with the E. S. & A. Bank which will allow interest at $2\frac{1}{4}$ per cent on money in the Club's accounts, and this should increase income by a few pounds each year. We have to thank Mr. Garret for making the suggestion leading to this arrangement. This only applies to money which the Club does not desire to invest in Commonwealth Loans.

2. The General Bank Account is the Club's working capital and over the last twelve months this has fallen by about £80. I feel that any reduction below this year's figure of £258 must be avoided if possible and that it must be built up again—it is the only source from which money may be drawn to purchase new assets from time to time.

3. The Finance Committee should meet regularly and advise the Club on financial affairs of all kinds.

On behalf of the Council,

A. G. Hooker, Hon. Treasurer.

FIELD NATURALISTS CLUB OF VICTORIA
STATEMENT OF RECEIPTS AND PAYMENTS FOR 12 MONTHS ENDED APRIL 30, 1957
(Figures adjusted to nearest £)

GENERAL ACCOUNT		
RECEIPTS	EXPENDITURE	
Subscriptions received—		
Arrears	£44	
Current	804	
Life Members	9	
	£857	
Sales of <i>Victorian Naturalist</i>	20	
Advertisements in <i>Naturalist</i>	12	
Interest received—Library Fund	2	
Donations received	121	
Total Receipts for the Year	1,012	
Excess Payments over Receipts for the Year	38	
	£1,050	
	<i>Victorian Naturalist</i> —	
	Printing	£752
	Illustrating	90
	Dispatching	79
		£921
	Working Expenses—	
	Postage and Telephone	£39
	Printing and Stationery	14
	Duplicating	41
	General Expenses	30
	Library	3
	Subscriptions, Donations and Affiliation Fees	2
		£129
	£1,050	

BALANCE SHEET AT APRIL 30, 1957

LIABILITIES	ASSETS
Special Funds—	Bank Current Accounts—
Building Fund	E. S. & A. Bank—General A/c.
1,398	£258
Publications Fund	State Savings Bank—Life Members A/c.
636	12
Library Fund	
50	
	£270
	41
Subscriptions paid in Advance—	Stock of Badges
Ordinary	Arrears of Subscriptions, estimated to realize
116	50
Life Membership	Deposit on Hall for Show, 1957
12	12
	Investment of Funds—
	Building Fund—
	Commonwealth Bonds, face value
	£950
	E. S. & A. Bank—No. 2 Account
	448
	1,398
	Publications Fund—
	Stock of Fern Books at cost
	£533
	Stock of Other Books at cost
	18
	E. S. & A. Bank—No. 3 Account
	85
	636
	Dudley Best Library Fund—
	Commonwealth Bonds, face value
	50
	Library, Furniture, Microscopes, Epidiascopic,
	Paintings, and other Equipment
	1,522
	£3,979

Audited and found correct.

W. P. J. EVANS, Hon. Auditor

A. G. HOOKE, Hon. Treasurer.

FERN BOOK ACCOUNT

To Stock on hand at 1/5/56 at cost—	By Sales—	
4,507 copies £845	1,688 copies	£545
" Purchases at cost—	" Stock on Hand at	
22 copies 4	30/4/57 at cost	
	(39) —	
4,529	2,841 copies	533
Credit Balance 229	4,529	
£1,078		£1,078

FIELD NATURALISTS CLUB, BENDIGO

The following information concerning office-bearers, meetings and excursions to December 1957, has been received from the Secretary:

Office-bearers:

President: Miss E. Flanagan, 1 Violet Street, Bendigo.
 Secretary: Mr. A. C. Ebdon, 45 Lucan Street, Bendigo.
 Treasurer: Mr. J. Ipsen, Bayne Street, Bendigo.
 Librarian: Mr. J. Kellam, 7 Patrick Street, Bendigo.

Meetings:

(Commencing at 7.45 p.m. at School of Mines, second Wednesday in the month.)

July 10—Subject: New Zealand Travel Talk. Speaker: Miss M. Patterson.

August 7—Committee Meeting.

August 14—Botany (Mr. J. Kellam).

September 11—Annual Meeting, address by ex-President.

October 9—History of Whipstick (Mr. W. Perry).

November 6—Committee Meeting.

November 13—Birds (Mr. R. Eddy).

December 11—Open, talks and specimens.

Excursions:

(Commencing from Gold Jubilee Statue; 10 a.m. for full day and 2 p.m. for half-day excursions).

Sunday, July 21 (full day)—Locality: Ridge Road, Taradale. Subject: Botany. Leader: Mr. R. Allen.

Saturday, August 17 (half-day)—Sedgwick, botany (Mr. G. Marshall and Mr. C. Wilkins).

Sunday, September 8 (half-day)—Skylark Gulley, botany (Miss E. Flanagan).

Sunday, September 22 (full day)—Wedderburn, botany (Mr. J. Ipsen).

Sunday, October 13 (full day)—Whipstick, botany (Mr. W. Perry).

Sunday, October 27 (full day)—Mitiamo, botany and general (Mr. J. Kellam).

Sunday, November 10 (full day)—Mt. Tarrengower, Maldon, general (Mr. A. Ebdon).

November 16 and 17 (week-end)—Woori Yallock with F.N.C.V., birds and general (Mr. E. Hanks).

Saturday, December 14 (half-day)—Meadow Park, birds (Mr. R. Allen).

MOUNT BULLER EXCURSION
(Christmas 1955—New Year 1956)

By K. W. ATKINS

The dreary Christmas week of 1955 will be remembered by most with mixed feelings, but to sixteen F.N.C.V. members who visited Mount Buller, its memory is a standard against which the success of future Club excursions will be judged. The stay at the Ivor Whittaker Memorial Lodge was made most comfortable and enjoyable by the genial hospitality of Mr. and Mrs. Harold Cummings.

The party left Melbourne by motor coach on Tuesday, December 29. As we were made along the Delatite valley from Mansfield, hopes fell, for swirling mists hid the Buller massif, and the ascent to the chalet was made in dense fog.

On Wednesday morning members strolled out in the drifting mist to inspect the surroundings. The number of ski lodges amid the Snow Gums surprised most, and though the growth of this alpine village has been criticized from the point of view of flora preservation, it became obvious later that it is the summer grazing by cattle that has devastated the area and caused the spread of such aliens as sorrel and clover.

The mists rose on Thursday and revealed the splendid panoramas of wooded ranges and rounded summits. The Chalet is amongst Snow Gums under which grow many smaller plants. *Ajuga australis* and *Wahlenbergia concolor* contributed their blues, *Grevillea heterolepis* bore bright orange blossoms, and *Poranthera microphylla* was more colourful there than in the lowlands. Notable amongst the granitic rocks were *Grevillea victoriae*, a tall and handsome shrub, and superb specimens of the white-flowered orchid, *Caladenia hyalina*.

Mount Buller, 5,911 feet high, is part of the spur running westward from Mount Howitt to Timbertop or Warrambat, 14 miles further on. It is a bold peak, small in area, and it contrasts strongly with most other mountains of the Victorian Alps as it retains none of the extensive tableland out of which these were carved.

Above the tree-line, beyond the Chalet, towards the summit of Buller, the slopes were covered with Snow Grass, in tussocks so dense and resitant that a member suggested renaming it "winter-spring grass". Here and there was shelter for *Ranunculus lappaceus* and *R. guianensis*, the latter, a precocious member of our alpine flora, having finished flowering. In both wet and dry spots, the sweetly-scented *Chrysanthemum australasicum* grew in mats; and nesting amongst the grass was *Prinsepia alpina*, a tiny gem with compact red and white flowerheads resembling Victorian posies. The matted *Veronica serpyllifolia* sent up its small spikes of blue flowers, and in wet depressions grew *Carex appressa* with dry khaki-coloured leaves that rustled like taffeta when disturbed.

Above the old ski hut on the northern slopes, springs and soaks feed a sphagnum swamp. Here *Exocarpus nanus* bears its scarlet fruits in season, and the rare snow-wort, *Diplosis hydrocotyle*, may be found if one searches on hands and knees. As well, this bog is a favoured home for many interesting plants: *Helichrysum hookeri*, *Astelia alpina*, *Lycopodium fastigiatum*, *Richea continentis*, *Epacris breviflora*, *Hypolepis lateriflora*, *Epilobium*, and others.

The slope towards the crest was a patchwork of shrubbery. *Hovea longifolia*, about to flower, was dressed in purple and brown, there were acres of silvery *Oxylobium olpestre*, and amid tumbled heaps of boulders grew picturesque plants of *Podocarpus alpina*. Above all, on the summit, the Forests Commission lookout struck a note of incongruity; it has been described as "resembling a temporary soft drink kiosk".

The steep north-western slope is a natural rock garden equal to anything one sees in a glossy English garden magazine. It has a brilliant array of *Wastrenia scutifolia*, the golden *Phebodium phyllitifolium*, yellow spikes of *Hulthia bullata*, bright green mats of *Scleranthus biflorus*, shrubby *Drimys lanceolata*, *Senecio pectinatus*, *Baccharis ramoxissima* espalier-fashion over the rocks, *Viola betonicifolia* nestling deep down in the crevices, and the honey-sweet *Grevillea australis*. But most glorious of all were the scattered clumps of *Euphrasia*, with flowers of every shade of lilac-mauve.

Where loose rock debris accumulates on the steep south-western slope the striking *Acyphella glauca* was encountered. With its dissected leaves and stout umbels of creamy flowers, it is among the finest of Australian montane plants.

Thursday afternoon was the longest period without mist or rain. It was pleasant to sit in the warmth of the sun, as Bogong moths fluttered about and little skinks scuttled fearlessly here and there. The formation of the Eastern Highlands could be appreciated. River action has deeply dissected this uplifted plateau into valleys overlooked by frowning precipices and beetling bluffs, and round the horizon one could recognize Buffalo, Cobber, Feathertop, Stirling, Howitt, Snowy Plains, Magdala, Baw-Baw, and other indistinct mountains fading into haze and cloud.

As Friday morning gave promise of fine weather, the party set out along the south-western ridge towards Warrambal. But grim clouds gathered, fog settled down, Snow Gums became grey shadows as the storm struck. Return was made to the haven of the Chalet, through stinging hail, sleet and cold. By Sunday the storm had abated, but the vegetation was snowed over; only an occasional buttercup flower showed through. Traditionally, there should have been robins with scarlet breasts, but it was Crimson Rosella that chattered in the fog and came down, in their red vests and blue coats for the household scraps scattered on the snow.

Despite the inclement weather, the party voted the excursion well worth while, and were sorry to have to depart on the Monday morning.

REFERENCES

Sutton, C. S. (1907). "A Botanist at Mount Buller." *Vict. Nat.* 23 (10): 175-180.
 Willis, J. H. (1945). "Among Alpine Flowers." *Vict. Nat.* 62 (8): 132-140.
 Wakefield, N. A. (1950). "Baron von Mueller's Victorian Alps." *Vict. Nat.* 66 (9): 163-168.
 — (1953). "Mount Buller's Botanical Century." *Vict. Nat.* 69 (12): 156-158.
 Fisch, P. (1953). "Visit to Mount Buller." *Vict. Nat.* 69 (12): 150-152

SUMMARY OF MEMORANDUM CONCERNING PROPOSED INCREASE IN CLUB FEES

Miss M. Elder amplified the suggestion tentatively made in her notice of motion concerning the need for closer attention to the aims of the club. These aims are clearly set out at the head of the front inside cover of this journal, and members should know them. She also proposed that the Annual Subscription should be raised to £5, and money allocated from this sum for the following purposes: (1) production of a larger *Naturalist* with a properly balanced arrangement of scientific and general articles, (2) preservation of fauna and flora of Australia, with particular attention to that of Victoria, (3) circulation of knowledge concerning natural history by publications and pamphlets, and (4) allocation of some money to the Club's Building Fund.

THE NATIVE WATER WELL AT WHROO, GOULBURN VALLEY

By A. MASSOLA*

About eight years ago, Mr. H. S. Parris¹ was puzzled about the significance of the English equivalent for the aboriginal name of Whroo when he was carrying out his researches into the history of the Goulburn Valley. He consulted *The Australian Race* (E. M. Curr), and found that Whroo was a variant of Woorro, a word used by local natives, the Taungurong, whose language was known to early writers (Curr included), as the Ngooraialum. Parris found that Woorro meant "mouth" in this language, but he was puzzled by this unexpected meaning and continued his researches. Later, Miss K. Lewis of Blackburn and Mr. Le Roy of Whroo informed him that there was a water-hole, formerly frequented by the natives, somewhere on a low hill known as Spring Hill to the diggers, and near the township of Whroo. He searched for this water-hole in the company of Mr. A. H. Perry of Balfestown and located it. Thus the mystery of the meaning of the name "mouth" was solved to his satisfaction.

During a recent visit to the site of the former Aboriginal Protectorate of the Goulburn, established by James Dredge in 1839, the writer was fortunate in having Mr. Parris for a companion and guide. A visit to the water-hole was suggested, and as well imagined, was readily accepted.

For those who are not familiar with the district, it may be mentioned here that Whroo no longer exists as a town, although it is on the map. This famous mining town once had a population of over twelve thousand, but only the ruins of a church, a cemetery of 340 graves, and evidence of mining activities remain. The forest is reclothing the hungry and clayey soil which had been cleared by the diggers. It is dense and low, in spite of the lack of water. All signs of human occupation are gone with one exception: Mr. Harry Pettifer lives there with Mrs. Le Roy who is his sister. They have arranged to leave the place for more congenial surroundings and then Whroo will go back to nature.

The scrub was so dense that it was necessary to enlist the aid of Mr. Pettifer to find the cemetery, but he did not know the whereabouts of the water-hole. We had no trouble in this respect, as Spring Hill is not more than 300 yards south-east from the cemetery, and the water-hole was found to be just over the summit, on the south-eastern slope of the hill. At this point an outcrop of micaceous sand-stone approximately 12 x 8 feet, emerges from the soil. On this outcrop an oval hole about 15 inches long and 10 inches wide has been sunk to a depth of about 3 feet. It is possible that it may have been deeper, but the bottom was covered with loose pieces of rock which

* Curator of Anthropology, National Museum of Victoria.

have fallen in from time to time. No doubt this hole was kept clean by the natives who used it, and possibly it was only a slot-shaped crevice. It was probably enlarged by the diggers so that they could immerse their billies. Native water-holes always have a small aperture so that they could protect them against pollution by animals and debris, and also against loss of water by evaporation. Animals



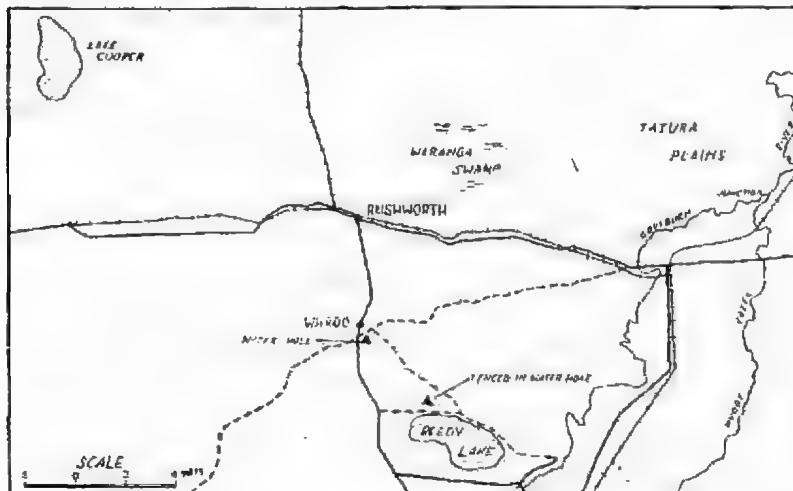
Photo by H. S. Parris

The "mouth" at Whroo.

are still using this well, as we saw abundant signs of kangaroos close to it. At the time of our visit (the middle of May) the well was full of water, although (according to Mr. Pettifer) no worth-while rain had fallen since the day before the opening of the Olympic Games in Melbourne (November 22, 1956). No doubt this well was fed by ground water percolating through innumerable crevices formed by the weathering of the sandstone of which this rock was composed. Water also collected from the surface and ran straight into the mouth, the north-east corner of which had been worn smooth by the flow of water. The general formation of the ground indicated that a channel had been cut from a point near the summit of the hill to this corner of the mouth. A second hole (obviously not due to natural causes), had been started on the western side of same outcrop, but it was only a few inches deep and contained no water.

The water-hole at Whroo is conveniently situated on the route which the aborigines must have followed between Reedy Lake and

Lake Cooper. As Mr. Parris has suggested to the present writer, this route would have passed by the Fenced-in Water-hole, the "mouth" at Whroo, the Waranga Swamp (now a reservoir), and then on to Lake Cooper. The name "Fenced-in Water hole" is given to a natural deep hole on Back Creek and kept fenced to prevent sheep falling into it. When surface water was available, a variant of this route would strike across the Tatura Plains after leaving



Locality Map. Drawn by A. Neboiss

Whroo, and reach the Goulburn River (the Waaring of the natives) in the vicinity of its junction with Muddy Creek (called Pranjip). It would have been dangerous for the natives to go much further north because they would run into the territory of the Joti-jota, a Murray River tribe with whom they were at enmity.

The plan of this series of water-holes is very similar to those at Maryborough². The local tribe was called the Taungurong and also Oorallim, Noorilim, Oorillium and Butherabaluk, as well as other appellations. However, it seems certain that the first mentioned was the true tribal name, and that the others were names of local hordes or groups. They belonged to the same "nation" as the Maryborough natives, the Jajaurung. The component tribes of this "nation", known as the Kulin, were in close contact with each other, and exchanged manufactured products, as well as sisters and daughters for wives. Therefore there must have been innumerable "trade routes" or pads crossing the country in all directions. Naturally the routes passed watering places at convenient intervals, but where there were no natural water-holes available, artificial ones were made

or adapted if the configuration of the terrain permitted. Proof of this trafficking amongst the tribes was found at Reedy Lake. Major W. J. Day, who owns a fine property adjoining the timber reserve there, possesses a number of stone artifacts collected at various times from sand dunes overlooking it. He has, amongst other implements, ground-edged axes which came unmistakably from Mt. William, near Kilmore, and others which undoubtedly came from the Western District. How did these reach the Taungurongs? Only the discovery of more water-holes marking the "trade routes" will furnish the answer.

REFERENCES

1. Parris, H. S., Early Mitchellstown & Nagambie: *Vic. Hist. Mag.* 23 (3): 126 (1950).
2. Massola, A., The Native Water Wells at Maryborough, Victoria: *Vic. Nat.* 73: 48 (1956).

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

AURORA RECORDS NEEDED

Professor Sydney Chapman's recent paper "The Aurora in Middle and Low Latitudes", *Nature* 179: 7-11 (Jan. 5, 1957), opens up a most fascinating subject and also draws attention to the fact that published records of auroral displays are "woefully fragmentary and inadequate". Undoubtedly there lie buried in newspaper reports, magazines, ship's logs, official records, personal diaries and letters many observations on the aurora that would increase our knowledge, and even a few gleanings from the past would repay the time spent on their recovery. Here is a field in which any Australian naturalist, with some enterprise, leisure and patience may usefully aid the cause of science—especially during the present International Geophysical Year.

In order to narrow down the search through endless newspaper and non-scientific paragraphs, Prof. Chapman lists the following dates of greatest magnetic storms recorded at Greenwich between 1874 and 1954. Information on the *aurora australis* is most likely to be found near these dates:

1882	Nov. 17, 20	1938	Jan. 25, Apr. 16
1903	Oct. 31	1940	Mar. 24
1909	Sept. 25	1941	Mar. 1, Sept. 18
1921	May 13	1946	Mar. 28, Sept. 21

One of the most spectacular of all auroras was witnessed on Sept. 1, 1859, visible even from such tropical places as Honolulu; it was intermittently widespread over the globe for a few nights before and after the maximum development. Another famous display occurred on Feb. 4, 1872, and was seen from at least eight parts of India, from Aden, Mauritius and the West Indies. Anyone who can assist, by searching for Australian (and other) records, should copy out the references—if not too long—and send them to:

Prof. Sydney Chapman, F.R.S.
Department of Natural Philosophy
University of Oxford
England.

Incidentally, the auroral light is now known to result from the entry into our earth's atmosphere of positively charged atoms (chiefly of hydrogen)

together with electrons: they come from the sun, during periods of great sunspot activity, and reach the atmosphere with a speed far exceeding that of meteors. The belts of maximum auroral frequency and intensity lie between geomagnetic latitudes 60° (north and south) and the two geomagnetic poles, with a falling away of frequency both north and south of the Antarctic and Arctic Circles.

J. H. Willis.

REJUVENATING POWER OF THE COAST CORREA

When I visited Wilson's Promontory recently, I gathered a specimen of a species of *Lepidium* which subsequently proved to be new for Victoria. While I was examining it I started a small sand-slide. The sand and I, the *Lepidium* and a small plant of the Coast Correa, *Correa alba*, all came down together. The Correa was a seedling with leaves and a single wiry tap root nearly a foot long. It seemed too much to expect it to grow if it was replanted there in the dry sand, so I brought it home. I could not find it when I arrived home, but I located it amongst some pressed specimens twelve days later. The dry root looked just the same and the leaves were still green, so I soaked it in water overnight and then planted it in the garden. It showed every sign of growing after twelve days between dry papers and three weeks in the ground.

J. RAY GALBRAITH.

CRICKETS AND SEAGULLS

During February and March of this year, Melbourne and suburbs had an infestation of the Common Black Field Cricket. They were numerous on the pavements in the city proper and found their way into many buildings.

The crickets were also present in large numbers at Black Rock and we often watched their flights on fine evenings. We made our observations along the stretch of foreshore between Balcombe Road and Ricketts Point. The crickets emerged from the nearby coastal vegetation about dusk and at an hour when the Silver Gulls usually flew northwards to their roosting grounds. During one evening in February, our attention was drawn to an excited flock of several hundred gulls wheeling and darting above the cliffs. They made a lovely sight silhouetted against the twilight sky with the sea as a background. Careful checking on several evenings when we saw the display repeated verified our impression that the crickets were the main, if not the sole, object of the foraging birds. Most crickets which rose from among the tea-trees and flew parallel to the shore, or a short way out to sea, were quickly snapped up; only those which headed inland seemed to have much chance of escape. While sufficient light remained, we could still see the gulls "hawking" and darting like swifts.

—I. P. HANKE

A NOTE ON THE GIPPSLAND MALLEE, EUCALYPTUS KITSONIANA

Everyone who has travelled through South Gippsland has seen the Gippsland Mallee, *Eucalyptus kitsoniana*, a dwarf eucalypt with relatively large leaves and rather large crowded fruits. Its buds are in clusters of seven on flattened stalks, and arranged in a circle of six surrounding a central erect one.

I noticed recently on Wilson's Promontory that the pointed caps of some of the buds bent inwards and were so pressed together that their sides were flattened. The buds were pointed and thin at that stage and I thought that they looked like one big bud divided into segments. I remembered that the western *E. preissiana* had similarly clustered buds which, when immature, were enclosed in a membrane making them look like one large bud. I found buds of *E. kitsoniana* in all stages: some were completely enclosed and looked like green galls about half an inch across, others had a tattered membrane which was turning brown and the inflexed buds were beginning to separate.

at the tips. The flattened sides of the buds rounded off as they spread into position and enlarged to the typical stout blunt-topped shapes. There was no trace of the enclosing membrane by this time and the caps which were being pushed up by the expanding stamens began to separate.

I made another interesting discovery. Some of the caps were scarlet and came away easily, leaving another one underneath. The operculum was double. The buds were well protected indeed, first by the enclosing membrane (doubtless formed by the fused bracts) and then by the double operculum. Both characters are known in other species, but it was exciting to find them in *E. kitsoniana*. As far as I know, the covers of the bud-clusters of *E. prae-*
stiana split symmetrically, but those of *E. kitsoniana* certainly do not. They break as regularly as deciduous bark splits from the limbs of a tree.

--JEAN GALERAITH.

SALES OF PUBLICATIONS AND BADGES FOR 1956-7

The following information concerning sales of Club publications and badges during 1956-7 has been supplied by the Honorary Treasurer:

Ferns of Victoria and Tasmania	£545	8	6
Victorian Toadstools and Mushrooms	138	11	0
Key to Victorian Snakes	1	16	0
Nature's Linguists	1	2	0
Census of Victorian Plants	1	0	0
Various other publications	2	16	0
Back numbers of <i>Victorian Naturalist</i>	47	16	0
Club badges	5	13	6
	£744	3	0

WHAT, WHERE, AND WHEN

F.N.C.V. Excursions:

Friday, July 12—Special Entomology excursion to the Museum. Mr. A. N. Burns, Curator of Insects, will be in charge of the party. Meet 7.45 p.m. at the main Russell Street entrance.

Sunday, July 21—Botany Group excursion to Ferntree Gully. Take 9.48 a.m. train to Upper Ferntree Gully or meet at 10.30 a.m. at the station. Bring one meal.

Sunday, August 11—Geology Group excursion to Frankston to see the collection of Mr. S. R. Mitchell. Travel details at group meeting.

Group Meetings:

(8 p.m. at National Herbarium unless otherwise stated.)

Wednesday, July 17—Microscopical Group.

Friday, August 2—Botany Group. The group will meet at 8 p.m. in Mr. Lord's room at 514 Little Collins Street (between King and William Streets).

Monday, August 5—Entomology and Marine Biology Group. The meeting will be in Mr. Strong's rooms in Parliament House at 8 p.m. Enter through private entrance at south end of Parliament House.

Wednesday, August 7—Geology Group. Subject: Minerals. Speaker: Mr. A. Cobbett.

Preliminary Notice:

Sunday, September 8—Parlour-coach excursion to Launching Place and Cockatoo. Leader: Mr. Haase. Coach leaves Batman Avenue at 9 a.m. Bring two meals. Fare 18/-.

MARIE ALLENDER, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7.

The Victorian Naturalist

Vol. 74—No. 4

AUGUST 8, 1957

No. 584

PROCEEDINGS

Nearly 90 members and friends attended the monthly General Meeting held at the National Herbarium on July 8, 1957. Mr. J. Ros Garnet, the new President, chaired the meeting. Apologies for non-attendance were received from Mr. and Mrs. Swaby, Mr. and Mrs. Rayment, Miss Young, and Mr. G. Coghill. The President referred to the deaths of Dr. W. J. Harris, a keen geologist, who had been a member of the Club since October 1914; Dr. Hugo Flecker, who became a member in 1927, but later transferred to the North Queensland Field Naturalists Club; and Dr. J. T. Rayment, son of Mr. and Mrs. Tarlton Rayment.

The minutes of the last meeting were read and confirmed on the motion of Mr. Hanks and carried after being seconded by Mr. Court. Mr. Sarovich suggested that the minutes be recorded in *The Victorian Naturalist* as soon as possible after their adoption.

The President announced that Mr. Middleton had been elected as a member of the Council to fill the vacancy left when our President accepted his present position.

Mr. Hooke moved that the Treasurer's report as published in *The Victorian Naturalist* be accepted. This was seconded by Mr. Woollard.

It was announced that preparations for our Nature Show next October in the Prahran Town Hall were well under way. It was also announced that the Moomba Show for next year would be held in Preston Motors showroom, and it was hoped members of the Club would be able to provide some of the assistance needed.

The motion regarding a proposed increase in Club fees presented by Miss M. Elder was discussed at the meeting. The Secretary read a letter from the Geology Group stating that all members were opposed to the proposal to increase fees to £5 per year. After several other members had spoken against the motion, the matter was referred back to Council for careful consideration. Mr. Sarovich suggested that *The Victorian Naturalist* should be published quarterly with monthly news-letters to save expense.

Mr. Wakefield delivered a lecture on the Snowy River Gorge illustrating it with a series of colour slides. He emphasized that the environs of the triangle bounded by the lower reaches of the Snowy and the Broadbent Rivers was one of great interest, from the scenic, botanical and zoological points of view. The lecturer suggested that this area would be most suitable for a national park, and Mr. Hanks moved that Council investigate this possibility. This motion was seconded by Mr. Middleton and carried.

The Secretary read a letter received from the Fisheries and Game Department asking for assistance in making a survey of edible shell-fish, and enclosing sheets for this purpose: these sheets will be passed on to the Marine Biology Group. The R.A.O.U. sent the Club a copy of a letter to the M.M.B.W. supporting a proposal to plant the Upper Yarra Dam site with Australian trees and shrubs and the Club supported this proposal. Mr. Sarovich appealed to members to help supply wildflowers for a display being held in Perth from September 9 to 14 next.

Mr. Wakefield reported that accommodation had been arranged at the Genoa Hotel for members participating in the excursion to Mallacoota at the end of this year. Further notes on this excursion appear under "What, Where and When" on page 58.

The President announced that the meeting would be a "Members' Night" and that those interested in taking part should contact Mr. Curtis as soon as possible.

The following were elected as members of the Club: Miss Shirley McMillan, East Malvern (Ordinary); Mr. V. Biskupsky, East Brunswick (Ordinary); Mr. J. Maurice Wilson, Highett (Ordinary); Mrs. Isa H. Anderson, Point Lonsdale (Country); Dr. C. T. James, Rose Park, South Australia (Country); Mr. W. J. Gittens, c/o 110 Maud Street, North Bulwyn (Country).

Mr. Kenyann asked the Club to support protests being made against the erection of school huts, and also the destruction of trees in Sherbrooke Forest. A motion by Mr. Coghill and seconded by Mr. Webb that the Club approach the Government with a view of having this area declared as a national park was carried. It was also suggested that the Club send a letter of protest to the Press.

The following were the exhibits for the evening. Sheath from fruit of *Monsiera deliciosa* from Pt. Vernon, Queensland (Mrs. Coghill); Polyzoa from Balcombe Bay Mornington (Mr. R. Lukey); land shells from eastern Victoria and Sherbrooke Forest (Mr. Gabriel).

The General Meeting closed at 10.20 p.m.

MICROSCOPICAL GROUP

Mr. Rob Lukey was the lecturer at the meeting on July 17 last, his subject being "Marine Polyzoa". There were 17 microscopes on the bench, each showing a specimen of these interesting creatures. Mr. Lukey had several of his own mountings, and explained the method of preparing them. He also described the difference between polyzoans and hydrozoans, also pointing out the peculiarities of the separate species and their habitat.

Mr. Lukey's command of his camera enabled him to show some beautiful close-ups in colour of several species on the screen.

The next meeting on August 21 will be devoted to an exhibition of accessories for the study of microscopy. All interested are requested to bring their collections of gadgets; interest will be shown by everyone in each other's sphere of study. Members are requested to make special efforts for this occasion.

SNOWY RIVER GORGE

By N. A. WAKEFIELD

[Summary of talk to the F.N.C.V. on July 8, 1957]

The Snowy River drains some four or five thousand square miles of country, with the greater part of its valley in New South Wales. In Victoria, the river itself follows a southerly course through East Gippsland from the State border-line to Orbost and thence to Bass Strait. As far as flow of water is concerned, it is by far the largest stream in Victoria.

Much of the upper part of the Snowy valley, in New South Wales, has been cleared for grazing purposes, and about Orbost the rich flats are used for dairying and agriculture; but almost all the Victorian tract of the river is through rugged mountainous country, much of which is very rarely visited by anyone.

The Prince's Highway — the "coast road" from Melbourne to Sydney — crosses the river at Orbost, and, in Victoria, there is only one other crossing, the "Big Bridge" which serves the road from Buchan, via Gellatly, to Benang. This is known officially as McKillop's Bridge, it is a huge concrete and steel structure about nine hundred feet long and sixty feet or so above water-level, but the road to it is very rough, narrow and steeply graded, and it is used only rarely by motor vehicles.

The "Turnback Road", leading down to McKillop's Bridge, gives the traveller a taste of the grandeur of the Snowy River valley, but for the really spectacular parts of it one must leave the roads and investigate some of the gorge tracts through which the river flows. What is probably the grandest of these is situated some twenty miles to the north-east of Buchan, a little upstream from where the Broadbent River joins the Snowy from the east.

This is an area which could be Victoria's really outstanding national park, something that would compare favourably with many of the most scenic parks in overseas countries. It has mighty crags of reddish rock flung up against the sky, and come down sheer for hundreds of feet to the waters of the river. Furthermore, the flora and fauna of the area are unique and well worthy of conservation and of the protection that would be afforded were the area to be reserved.

In December 1951, Mr. John Béchervaise gave the F.N.C.V. a talk on the Snowy River gorges, illustrated by a series of fine colour slides. His party had made its way down the river from the Suggan Buggan area to Buchan. There have, too, been several canoe expeditions down the Snowy through these tracts. But the thorough exploration of the gorge and cliff area with which we are now concerned was accomplished by Mr. Leo Hodge, from about 1950 onwards.

Hodge is a Country Member of this Club, living at W. Tree, a locality about sixteen miles north of Buchan. For some years it has been his hobby to build up a garden of native flora about his home. This project has proved an outstanding success, and the quarter-acre block now has plants of some 160 Australian species, ranging from trees to small herbs; and the great majority of these are from the Snowy River area.

During the process of searching the rugged country for suitable garden subjects, some noteworthy discoveries were made. Those species occurring in the comparatively small cliff area which we are discussing may well be enumerated here.



Snowy River Gorge.
The top of the gorge is conspicuous on the left.

Boronia ledifolia grows here and there over a mile or so of country, forming thickets several feet high and clothed in springtime with massed reddish blooms. It is certainly our showiest Boronia, not known to occur elsewhere in Victoria, and it was a new record for the State when discovered by Hodge in about 1950.

Hesstringia crenulophila has recently been "described"—a species new to science. It is a remarkable shrub, forming clumps which apparently spring from the solid rock of sheer cliffs; and in both foliage and blossom it is a most attractive plant. This, too, was

discovered by Hodge in about 1950, and it has never been found outside the area.

The Guinea-flower, *Hibbertia spathulata*, is apparently endemic in the vicinity of the gorges concerned. It is a bushy shrub up to several feet across, and was originally discovered by the present writer in 1953.

The "Snowy River Wattle" has been known to local folk for many years, and it was collected as early as 1883 by A. W. Howitt. The species was not scientifically named until 1955 however, when it became *Acacia humptiana*. It is apparently confined to the Snowy River valley and is a feature of our particular gorge area.

The Hop-bush, *Dodonaea rhombifolia*, has a similar history. It was found by Baron von Mueller in 1874, growing along the upper Murray River, but it was not scientifically named until 1955, and the type specimens of this "new species" came from cliff ledges of our Snowy River gorge.

In 1946, the writer found a new species of daisy, at Bete Bolong (half-way between Orbost and Buchan) and also along the Gipps River. This was given the name *Brachycome riparia* by G. L. Davis in 1954. The plant is known as the "Snowy River Daisy", for it is a feature of the waterside rocks along the river, including those in the gorge.

A similar story belongs to an attractive shrubby Beard-heath. This, too, was originally discovered in 1946 at Bete Bolong; it was named *Leucopogon riparius* in 1956; and the Snowy River gorge is the only other place where it has been found.

Among the huge tumbled rock-masses along the river one finds occasional clumps of the Rough Maidenhair, *Adiantum hispidulum*; and in the shrubbery higher up are masses of *Phebalium squamulosum*. Both these are northern species which reach Victoria only in far-eastern Gippsland, and each is known in the State from but a few spots.

Apart from these endemic and rare plants, this cliff area contains much of particular botanical interest. One is surprised to find several western Victorian species there. Where the soil is shallow on extensive rock outcrops, a mixture of Fringed Heath-myrtle, *Micromyrtus ciliata* and Crimson Kunzea, *K. parvifolia*, forms tangles acres in extent. Lower down towards the river there is the so-called Desert Phebalium, *P. glandulosum*, growing quite luxuriously, in anything but desert conditions.

A remarkable feature of the banks of the Snowy River is the occurrence of the Forest Red Gum, *Eucalyptus tereticornis*. This species does not occur as a forest tree anywhere between the lower Tambo River district and the Bega district of south-eastern New South Wales. Along the Snowy, however, but only up to flood-level, one finds the Red Gum growing with Mallee-like habit, with huge butts and numerous small trunks. This is because these trees

originated from seeds brought down, evidently from New South Wales, by flood-waters, and every major flood inevitably smashes the trunks from every one of them, and they must sprout afresh.

On one occasion, Leo Hodge and the writer stood on a mass of flood debris which was piled on a rock ledge eighty or a hundred feet vertically above the normal river-level. And there were Red Gum growing on ledges twenty feet higher up! This gives some indication of the nature of the flow of water through the gorge during major floods, and from it one can form an idea of the country there.



In the Gorge.

Westringia crenophylla grows on the vertical cliff.

During the past five years, the writer has been into this gorge area several times, on each occasion with the pleasure of Hodge's company. The place is approached by a road which runs for about five miles easterly from the Buchan-Gelantipy road, to the old Tulloch Ard homestead. From there, a Forests Commission access road goes off to the south, parallel to the Snowy. It is about $1\frac{1}{2}$ miles from the river and some 2,000 feet or more above it.

To approach the gorges laterally, that is, from the southerly road, one must negotiate a tangle of scrub-covered cliffs, with the constant threat of a major cul-de-sac. However, it is comparatively easy to reach the river by a descent along a steep spur from the eastern Tulloch Ard paddocks, and thence to work down-stream into the gorges. In doing this, one encounters some very pretty rock formations, where huge masses of dark blue indurated shale, worn smooth by flood-waters, alternate with the reddish porphyry.



Part of Snowy River Gorge

This gorge country is one of the only two general areas where the Brush-tailed Rock-wallaby is known to survive in Victoria. Details of the story of the supposed extinction of this lovely marsupial and of its eventual rediscovery are fully set out in the *Victorian Naturalist* of March 1954. Accompanying that report are a map and some reproductions of photographs of the country. There is a general view of the valley, looking north from "Westringia Cliff" (where *W. crenulophila* was first found); a second is of part of the gorge, seen from one of the caves where the Rock-wallaby

camps; and a third picture is of the tracks of one of these animals on the sandy floor of another cave.

Lyrebirds are abundant about the cliffs; wombats are in evidence, and it is certain that the area is the home of numerous gliders, possums and such. But, as marsupials are mainly nocturnal, it would be difficult to determine what species do occur in the locality.

A recent visit to the place, during Easter this year, revealed evidence of at least one more very rare animal. Here and there in the sand amongst the rocks there were numerous sets of tracks that obviously belonged either to a species of jerboa-marsupial or else to one of the hopping-mouse group of rodents. As such creatures belong to the Inland, the discovery of one of them along the Snowy River in Gippsland is as remarkable as is the occurrence of the Desert Pheasant there.

Were this area of gorges and cliffs to become one of our national parks, the picturing of it in magazine and brochure would add substantially to the tourist attraction to Victoria. The place would not be damaged by vandals, for such persons do not visit anywhere so removed, in terms of effort, from the beaten tracks. And, as much of it is, and would remain, virtually inaccessible, it would continue to provide inviolate sanctuary for its unique fauna and flora.

VASCULAR FLORA OF VICTORIA AND SOUTH AUSTRALIA (Some Corrections and Additions)

By J. H. WILLIS*

In a recent paper [Vic. Nat. 73: 149-160, 188-202 (Feb. and Mar. 1957)], I described sundry new species and varieties of flowering plants, made several new combinations and discussed some synonymies affecting the Victorian flora. Since then, additional information has shown the need for certain corrections which are set out hereunder, following the same arrangement of species:

STIPA NIVICOLA J. H. Willis

[I.e. 150 (Feb.)]—This new species was said to be known only from a limited area at the southern end of the Bogong High Plains. Its occurrence on the Mt. Buffalo plateau is now recorded. A collection made by Dr. R. T. Patton, more than a decade ago, had been placed in the Melbourne Herbarium folder of *Stipa muelleri*; but, almost the only points in common between the two species are a *rigid habit* and *very long stout awns* to the large lemmas—otherwise they are quite unrelated and in different subgenera. A search through F. N. Hobson's excellent reference collection of Buffalo plants (made while he was ranger there during 1930-1, and now housed in the Melbourne Herbarium) brought to light another sheet of *S. nivicola*, also determined as "*S. muelleri*" and accompanied by the remark "widely spread on the Horn Plain". These two contributions extend the range of *Stipa nivicola* by 30 miles, and one may anticipate its occurrence on other nearby alpine tracts of the State. Mt. Buffalo samples are in a more advanced

* National Herbarium of Victoria.

flowering stage than the type, showing that the inflorescence may bear up to 25 spikelets, while the length of matured anthers is 5 mm. (not 1-1.5 mm., as quoted in my original description).

EXOCARPOS LEPTOMERIODES F. Muell. ex Miq.

[I.c. 151 (Feb.)]—This name had been restored for the eastern-inland Mallee tree previously referred to *E. aphyllus* R. Br. [the epithet incorrectly spelt "aphylla" by the writer, who had overlooked the fact that *Exocarpos* is a masculine word]. Reasons were advanced for considering *E. aphyllus* a different species smaller stature and fruits, rather differently striated thicker branchlets, etc. In the meantime Dr H. A. Stanffer, who is engaged in monographing *Exocarpos* and other Santalaceous genera, wrote to me from Switzerland (5/5/1957):

I have some doubts in separating the "aphyllas" forms in two distinct species. Careful examination of the plant [e.g. the *E. aphyllus* according to your Note p. 151 (Feb. 1957)] from Yorke Peninsula showed that the different habit of stem striation and indument was due to an infestation of a fungus . . . one of the Capnodiaceous fungi. . . . There probably, of course, differences in growth-form and in fruit, I have seen numerous specimens from Western Australia, however, that with certainty are not to be distinguished from the East Australian plants. . . . In other Australian *Exocarpos* I found evidence of variability.

Botanists in Sydney and Adelaide, working through collections of *E. aphyllus* in their respective State Herbaria, also wrote [personal communications] expressing inability to sort the materials into two distinct entities. It seems that the smaller, incassated south-coast plant of South and Western Australia, looking so very different in branchlet and fruiting characters from the Mallee tree of Victoria, western New South Wales, Queensland and (apparently) also north-western Australia, is merely a "pathological case"—connected to the latter, normal condition by a gradation of forms and quite inseparable specifically. So, Bentham was right in 1873 (except in his treatment of *E. dasytachys* Schlechter) and, after its brief inglorious resurrection, *E. leptomeriodes* must again sink into the synonymy of *Exocarpos aphyllus*! It would be interesting to find out if stunted, incassated forms of several other species in this genus (e.g. *E. spartens*, *E. strictus* and *E. cupressiformis*) were also attributable to infestation by the same or related Capnodiaceous fungi.

ACACIA KYBEANENSIS Maiden & Blakely

[I.c. 158 (Feb.)]—Freestone Creek (north of Brigalong) and near Little River Falls (Wulgulmerang) were recorded as first Victorian localities for this mountain wattle. A further visit to the latter district last April, in company with Mr. N. A. Wakefield, showed that *A. kybeanensis* is frequent on rocky slopes along the Boundary Creek between Gelantipy and Wulgulmerang, and also along the forest road linking Wulgulmerang with Mt. Seldom-seen [one of the few occurrences in Victoria of *Eucalyptus kybeanensis*, a dwarf subalpine mallee, is on this same peak]. The original patch below Little River Falls, whence fruiting examples were gathered in January 1948, had been burnt out in a severe bush-fire four years later, but it was gratifying to see excellent regeneration of the wattle for about a mile along this road. *A. kybeanensis* is a shapely ornamental plant in the Wulgulmerang district, forming dense rounded bushes (3-6 feet high) with a prevailing cast of soft pinkish-grey—except in the springtime when they are smothered with golden blossom.

LOMASTELMA SMITHII (Poir.) J. H. Willis

[I.c. 197/8 (Mar.)]—There still seems to be no unanimity of opinion among specialists in the Myrsinaceae, as to what (if any) are the constant points of departure between secrete genera originally grouped under

Eugenia. In view of this, and the fact that other Australian botanists are by no means sure that R. McVaugh (1956) was correct—although the writer believes he was—in typifying De Candolle's genus *Aemena* by *A. floribunda* (now regarded as a species of *Angophora*), I was, perhaps, over-hasty in making this radical name-change for Lilly-pilly, a widely distributed Australian tree. If *Lomastelma* were to be adopted, there are other species belonging to the same genus in subtropical and tropical Australia, New Guinea and Indonesia, for the names of which new combinations would need to be made. In 1949 I inquired of the late Mr. C. T. White concerning his attitude to the splitting up of *Eugenia* in Australia. He replied (4th October):

I think Dr. Merrill agrees with me now that we can recognize two genera, *Eugenia* (sensu stricto) to embrace the American trees and a few Australian and Malayan ones, and *Syzygium*. I intend to do this before I leave for Kew early in 1951.

White made no mention of *Aemena* or *Cleistocalyx*, so apparently he intended placing them also under *Syzygium*.

In April 1949, M. R. Henderson had published a long paper, "The Genus *Eugenia* (Myrtaceae) in Malaya" [Gardens' Bulletin, Singapore 12: 1-293]. He discussed in detail the splitting up of *Eugenia*, and concluded that it was impossible to recognize derivative genera in the Malesian region, as Merrill and Perry had done—all of the suggested criteria broke down when applied to certain species which formed connecting links between the supposed genera; so he reduced the latter to sectional rank under *Eugenia*.

Quite recently, K. A. Wilson has defended Henderson's attitude in "A Taxonomic Study of the Genus *Eugenia* (Myrtaceae) in Hawaii" [Pacific Science 11: 161-180 (Apr. 1957)]. The Archipelago's eight species would fall, according to Merrill and Perry, into *Eugenia* (in the narrow sense) and *Syzygium*, separable by the nature of the embryo (fusion or otherwise of the cotyledons) and by the degree of adherence of testa to the cotyledons. Wilson writes as follows:

The conclusions I have drawn . . . strongly support Henderson's rejection of the segregation of species of *Eugenia* into the genera *Syzygium* and *Eugenia* sensu stricto. . . . Neither one of the characters is constant. The degree of fusion of cotyledons varies even within a single species. . . . The characters of the seed . . . do not justify the split.

Until there is general acceptance among systematists, both here and abroad, of a workable scheme to subdivide *Eugenia*, I now consider it unwise to attempt generic segregations of our Australian species and will revert to *Eugenia smithii* Poir. for the Lilly-pilly, assigning my name *Lomastelma smithii* to synonymy.

OBITUARY: A. S. CHALK

In March 1957, the Club lost one of its staunchest supporters and a well-tried friend in the death of Aubrey Chalk.

He was born at Berwick, and learnt to know the bush as a lad, and the nests and eggs of birds always fascinated him. Those of us who went on field rambles with him, vividly remember his gift for thinking as did the birds when it came to nesting-sites. "That would be the place to look for the nest of a Wattle-bird," he would say. And, as often as not, there it would be. He was always happy to lead trips to his home ground—the bush about Berwick and Beaconsfield, and there are many memories of days watching Helmetted Honeyeaters at Cardinia Creek, and, after stern warnings on protection, being shown fine groups of the Purple Dracus along the railway line.

We knew him as a man of kindness and goodwill, and will remember with gratitude his willingness to share his knowledge of the bush. Aubrey Chalk joined the Club in 1930, and was President in the year of the Club's 60th

Anniversary—1940. Not only did he give the Club his whole-hearted support by attending meetings with unfailing regularity, but he gave twenty-seven years of untiring service as auditor—a position which he held at the time of his death.

He leaves a widow and two daughters of a previous marriage, to whom the Club extends its sympathy.

—J. M. WATSON.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

SALMON-TROUT, WHITEBAIT, GULLS AND FISHERMEN

Salmon-trout which had been present in the Black Rock area during June and early July this year were in dense schools which came close inshore, providing some great spectacles. Thousands of Silver Gulls formed long rafts, floating quietly while they waited and watched, and now and then the salmon-trout started leaping partly out of the water, causing the sea to "boil" in a circular area of about 60 feet diameter. Immediately the gulls caught sight of them, they flew to the outskirts of the bubbling ring and seized a share of the whitebait which had been driven to the surface under mass attack by the salmon-trout. A number of waiting fishing-boats were cruising around, and no sooner had the gulls located the shoals the fishermen sped to the spot and fished for salmon-trout. Good hauls were taken for about 10 or 15 minutes, then these larger fish took fright and left the locality. The sea became placid again and the gulls waited in big congregations until the "boiling" of the sea—sometimes in a number of places at the same time—started the process off over again. The whitebait leapt out of the water on to the beach to escape one close inshore attack by the salmon-trout, but they were seized by the Silver Gulls waiting there. I am certain that there has been an increase in the Bay population of gulls since the whitebait arrived. But how the information reached the gulls in distant and less favoured areas is beyond me.

—E. S. HANKE.

FANTAIL CUCKOO: COINCIDENCE OR HABIT?

Those who subscribed to *Wild Life and Outdoors* may remember the reproduction, on page 89 of the magazine's final issue (January 1954), of a letter from a very junior naturalist. It read, "A Fantail Cuckoo comes to set on our cloths line once every year. Mirinda Manfield Age 6" Mirinda's father added that the "cuckoo visitor has ALWAYS (three years in succession) made for exactly the same perch; and has always turned up in the first or second week of July".

About a year ago, on July 13, 1956, a Fantail Cuckoo was perched on a palings fence about fifteen feet from the dining-room here at Noble Park. This was thought to be most unusual, for these birds normally spend the winter far from the Melbourne area, in warmer, more northern parts. BUT, today (July 21, 1957), there was a Fantail Cuckoo *on the same fence outside the same window*. On this occasion it was eating a "Hairy Mary" caterpillar, and shortly afterwards it flew onto a nearby apple-tree to catch another.

There is reason to believe that we have something more than coincidence in these observations. Do cuckoos (and perhaps other migrating birds) normally follow exactly the same routes on their annual movements even to the extent of perching in the same trees, or on the same clothes-lines and fences? And, if so, do such routes belong to individuals or to groups?

—N. A. WATFIELD.

SECONDARY LOBES ON A FERN PROTHALLUS

Some years ago a sporangial plant of the small Annual Fern, *Anogramma leptophylla*, was found in the damp shade of basalt boulders. Later a very large prothallus was transplanted from the same spot and kept indoors under a glass beaker. It was examined for antheridia and archegonia after some time had elapsed but none was found. It was replaced under the glass in a somewhat wilted state. A few days later a passing glance revealed the presence of bright green specks over the whole of the upper surface. These were examined under the microscope and proved to be tongue-like growths crowded with antheridia. Antheridia were also scattered singly over the old surface. Other ferns have failed to make these growths and no more that could have belonged to *Anogramma* have been found. This note is published in the hope that readers will search similar spots during spring. *Anogramma* is rarely found, but this might be because it is so small. Several questions arising from this observation might be asked. Where are plants to be found. And could similar treatment and results be obtained from them? Also, could this treatment be applied to prothalli of other ferns?

—A. J. SWABY.

WHAT, WHERE, AND WHEN

F.N.C.V. Excursions:

Sunday, August 18—Botany Group excursion from Croydon to Ringwood. Take 9.15 a.m. train to Croydon. Bring one meal.

Sunday, September 8—Parlour-coach excursion to Launching Place and Cockatoo. Leader: Mr. Haase. Coach leaves Batman Avenue at 9 a.m. Bring two meals. Fare 18/-. Bookings with Excursion Secretary.

Group Meetings:

(8 p.m. at National Herbarium unless otherwise stated.)

Wednesday, August 21—Microscopical Group.

Monday, September 2—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms in Parliament House at 8 p.m. Enter through private entrance at south end of Parliament House.

Wednesday, September 5—Geology Group. Subject: Beginner's Night.

Friday, September 13—Botany Group. The group will meet at 8 p.m. in Mr. Lord's room at 314 Little Collins Street (between King and William Streets).

Preliminary Notices:

Sunday, September 29—Parlour-coach excursion to Brisbane Ranges. Leader: Mr. I. Hammett. Coach leaves Batman Avenue at 9 a.m. Bring two meals. Fare, 18/-. Bookings with Excursion Secretary.

Thursday, December 26—Wednesday, January 1—Parlour-coach excursion to Genoa, East Gippsland. Leader: Mr. N. A. Wakefield. Headquarters will be at Genoa where hotel accommodation is available for £13/10/- for the six days. Excursions will be made to Mallacoota, Eden, Mount Drummer, and other places of interest. The bus fare will be £6/15/- including the day trips, and there will be an extra charge of 10/- for a day in motor launches. Bookings (accompanied by £2 deposit) should be made as soon as possible with the Excursion Secretary. Further details will be given in the next issue of *The Victorian Naturalist*.

MARIE ALLENBERG, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7.

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PROCEEDINGS

Nearly 100 members and friends attended the monthly General Meeting held at the National Herbarium on August 12, 1957, and the President, Mr. J. Ros Garnet, occupied the chair. After the minutes of the previous meeting were taken as read and confirmed, the various members participating in "Members' Picture Night" gave their lectureettes. A brief summary of each talk is given below, in the order in which it appeared.

Mr. Stewart: *Mt. Buffalo Plateau*. An interesting series of colour slides illustrating the scenic beauties of Mt. Buffalo, and some pictures of some of the native flora highlighted this lecturette. Mr. Stewart pointed out two or three interesting facts concerning the flora of this region. The Alpine Plum Pine, *Podocarpus laurocianus* (Syn. *P. alpina*), grows only on the southern slopes of the ranges. He also indicated that the flora of one side of the mountains differs from that on the other. One slide showed the trunk of a eucalypt clasping a large boulder. Mr. Stewart rounded off his lecturette with some slides showing some striking panoramas seen from Mt. Buffalo.

Mrs. Bennett: *A Swarm of Bees*. This short talk consisted of a medley of colour slides showing a nest of bees in an old gum, and also some slides of *Correa reflexa* in the Cheltenham Park and *Acacia podalyriifolia*. Another slide showed two very hardy swimmers on the Sandringham beach on July 29 last!

Mr. Jennison: *Freyberg Peninsula*. The general characteristics of the coastline of this region were illustrated by a series of colour slides. The coastline is rugged and the cliffs are very precipitous with prominent outcrops of red granite which is quarried for veneer used in buildings in Hobart. Mr. Jennison also showed some slides of the uncommon Pencil Pine, *Athrotaxis cupressoides*.

Mr. Pinchin: *Birds*. Mr. Pinchin illustrated the nest of the Crescent Honeyeater. It is a relatively bulky structure found in tea-trees and consists of bark covered by twigs on the outside and lined with fine grass and seeds on the inside. The eggs measure 19.2 x 14.1 mm. Very close photographs of both male and female birds were shown and it was evident that the male bird was the most brilliantly coloured.

Miss Blackburn: *Mt. Buller and Mt. Wellington*. The first slides were of Mt. Warrenbat or Mt. Timbertop, a mining settlement which once consisted of 2,000 people and three hotels. Many beau-

tiful vistas were projected on to the screen and some slides of native flowers including Common Everlasting, *Helichrysum bracteatum*, and Grass Trigger Plant, *Stylidium graminifolium*, were shown. Miss Blackburn stated that some of the rock strata consisted of conglomerate many feet thick. Several slides of Lake Tali Karing were also shown, and notes on the surrounding country were given.

Mr. Byrne: *Funnel-web Spiders*. At the present time Funnel-web Spiders are receiving a prominent place in the press and radio, and it was topical to see some photographs of these interesting but ferocious animals. The body of a fully grown spider measures about one and a half inches across, and the female is less deadly than the male although it looks as aggressive. The slides showed the spiders in various positions and illustrated the attitude taken by them when ready to strike. They rear up so that they can strike downwards, but they can also jump forwards and strike at the same time. Mr. Byrne stated that experiments seem to indicate that the venom of the male spider is the more dangerous of the two.

Mr. Mollison: *The Blue Mountains*. Although this was a short talk, the slides of the country around Victoria Pass were very interesting. Several scenes of the pastoral country seen from near the pass were shown with colour shots of *Dampiera stricta*, *Acacia salicina*, *A. juniperina* and *A. decurrens*.

Miss Woollard: *Pineapple Heath, Tasmania*. The Pineapple Heath, *Richea pandanifolia*, is a tall shrub with pandanus-like foliage, growing up to twenty-five feet high. Miss Woollard showed some very good close-ups of the flowers and some showing the small cap covering the flower being pushed off. There are no caps covering the flowers when it is in full bloom.

Mr. Allan: *Cradle Mountain*. During January Mr. Allan accompanied a party of scouts through the Lake St. Clair-Cradle Mountain National Park. Many interesting slides were shown of the various mountain peaks to be found in this region, and it was particularly interesting to see a photograph of the chalet built by Mr. Weindorfer who was called the "Hermit of Cradle Mountain". Other scenes showed swampy flats and lakes now occupying the bases of old glacial valleys which are fairly common in that part of Tasmania.

Mr. Wakefield: *An Invitation to Mallacoota*. This series of slides gave members some idea of the scenery and attractions which will be found on the excursion to the Genoa and Mallacoota districts from December 26 to January 1 next. The Mount Drummer jungle which will be examined during the excursion consists of typical tropical vegetation and occurs in patches without any eucalypts in them. Among the wildflowers shown were Pink Bottonia, *Boronia*

mulleri, *Fittisporium revolutum*, and *Angophora intermedia*. He also showed slides of a mistletoe which parasitises another mistletoe.

Mr. Haase: *Club Outings*. The slides shown in this feature were some of the highlights seen on several Club outings, among which those to the Lalal Falls, Ballarat, Phillip Island, Maroondah Dam, Lake Mountain, Trentham Falls, Dimboola and Mount Difficult figured prominently. All places were illustrated with colour slides.

After the lecturetes were delivered, the ordinary business of the Club was resumed.

The President welcomed several visitors to the meeting and received apologies for non-attendance from Mr. and Mrs. Hanks, and Mr. Matthews. Mr. Scott, a Club member of long standing, received a certificate for Honorary Life Membership.

Mr. Court reported that arrangements for our forthcoming show were proceeding smoothly, but stressed that volunteers are urgently needed to help in setting up the exhibits. It was reported that the Mooinha Show was to be an integrated show and would be held in Preston Motors' showrooms. A special design for the layout was being prepared and various organizations would be able to sell publications at the show. Volunteers will be required to help set up the exhibits for this show also.

A report from Council concerning finance and the proposed increased Club fees was read by the Secretary. It was decided that more enthusiasm instead of more money was required in the Club, and, therefore, there will be no increase in Club fees, at least for the present. Mr. Swaby, assisted by Mr. Middleton, has been appointed to lead a committee which will act to foster interest in various research projects and surveys to be carried out by members, and those interested are requested to contact Mr. Swaby.

It was announced that this Club will be holding combined excursions with the Bendigo F.N.C. during November 16 and 17 next (see "What, Where, and When" on page 74 of this issue).

The Honorary Secretary, Mr. Coghill, drew the attention of members to the fact that August 13 last was the Centenary of Baron von Mueller's appointment as Director of the Botanic Gardens. He also mentioned that pamphlets setting out the details of two excursions to the Grampians on September 28 and October 5 had been forwarded to the Club by the Tourist Bureau. The purpose of the excursion is to visit the wildflower display and some of the scenic spots of that area. Those interested should contact Mr. Coghill.

Mr. J. M. Landy, Timbertop, via Mansfield, and Mr. L. G. Hearson, Frankston, were elected as Country Members of the Club.

Nature Notes and Exhibits.—Mrs. Bailey made some comments concerning the Smooth Rambutan, *Alectryon subcinerous*, which is a very rare tree in Victoria, stating that she had raised some plants from seeds obtained from a specimen growing in Studley Park.

Mr. Gabriel commented on a bivalve shell smaller than a three-penny-piece. This shell, which was very unusual in that its "arms" diverged by about 50 degrees when fully "closed", is found under rocks and in burrows at low water. Mrs. Bennett exhibited a pot of the Nodding Greenhood, *Pterostylis mutans*, with leaves of the Tiny Greenhood, *P. parviflora*, beside them. Mr. Coghill commented that a friend caught a platypus on a dry fly and suggested that there is more to find out about this animal. Miss Wigan, in reply to a comment made on the presence of the White Egret near Heidelberg by Mr. Savage, said that these birds were rare visitors to Melbourne. Three specimens had recently been seen in the Botanic Gardens.

ASSISTANCE REQUIRED FOR F.N.C.V. NATURE SHOW

The Honorary Organizer of the forthcoming Australian Nature Show, to be staged in the Prahran Town Hall on October 10, 11 and 12 of this year, requires assistance from members willing to help in setting up and caring for the various display units. Members who can help in any way are requested to contact A. B. Court, c/o National Herbarium, South Yarra, S.E.1, immediately. Help with transport of exhibits, both large and small, is also required. Remember, this is a Club show and if it is to be successful, help must be forthcoming from members themselves. THIS MATTER IS VITALLY IMPORTANT.

MICROSCOPICAL GROUP REPORT

The August meeting of the Microscopical Group took the form of a microscope accessory night for which most members brought along their microscopes and several pieces of apparatus. These were described for the benefit of those who were not aware of their uses, and among these articles were a number of obsolete pieces of apparatus described by Mr. Middleton, such as Lieberkühn, silver-side reflectors, and object tweezers. Other instruments included were a dissecting stereoscopic binocular microscope, take-apart pond-life trough, aperitometer, photo-micrographic camera, special apparatus for a micro-projection attachment to a 35 mm. projector, and many others too numerous to detail. They illustrated the various interests of the members and their uses.

MICROSCOPICAL GROUP FILM NIGHT

All members and friends of the F.N.C.V. are invited to a picture night to be held in the National Herbarium at 8 pm, on Wednesday, September 18. There will be 1½ hours of interesting and educational films loaned by the courtesy of the State Film Centre and the projectionist will be Mr. Ashley Nance. The following films will be shown:

"Tiny Water Animals".—A study of *Amaeba* and *Paramecium* using time-lapse photography.

"The *Ameeba*".—This film illustrates how this organism captures and ingests its prey by the production of pseudopodia.

"*Daphnia* (Water-fleas)".—The life-cycle of water-fleas, their food, life processes, heart action and reproduction are illustrated.

"Development of Trout".—Time-lapse studies of their growth from the egg stage, showing blood circulation, formation of eyes, ear-capsules, brain and aamtochord.

"Interdependence of Pond Life".—This is a study of plants, bacteria, infusoria, larger pond creatures and fish, all of which depend on each other for their existence.

"Pond Insects".—This film shows the food habits, and the struggle for survival of the diving water-beetle, may-fly and dragon-fly.

"Life Along the Water-ways".—An eleven-minute colour film depicting the many forms of plant and animal life found near ponds, streams and marshes and illustrating the dependence of this community on the water-ways.

A REINTERPRETATION OF THE CAVE OF THE SERPENT

By A. MASSOLA*

The aboriginal painted rock shelter known as "The Cave of the Serpent" was first made known to the world by an article by Charles Barrett which appeared in the *Herald* of April 2, 1929. In it Barrett stated that this "cave" had been visited the previous week by Mr. A. S. Kenyon, who claimed to be the first ethnologist to see it. In a subsequent article in the *Ararat Advertiser*, Kenyon stated that he had heard of it from a Mr. J. E. Shoebridge of Ouyen, Victoria. It appears that the cave had in fact been known previously, but had been "lost" about sixty years prior to its rediscovery, and the vague rumours about its existence had been relegated to the realm of fantasy.

The Cave of the Serpent is situated on the southern slopes of Mount Langi Ghiran, the "home of the Black Cockatoo", and consists of a spacious rock shelter ten feet wide and about forty-five feet long. It is, of course, open at both ends, as it was formed by the splitting in two of a massive granite boulder. These two halves moved apart at the bottom leaving a kind of gallery running east and west. On the south-eastern corner of this gallery a large slab has broken off the boulder and lies at the foot in fragments. This left a smooth, niche-like face, twelve feet wide by ten feet high, facing north-east and protected at the top by the lintel-like remains of the slab. It is this face that the aboriginal artist chose as a canvas for his painting. A drawing of this painting was published by A. S. Kenyon in *Australian Aboriginal Art* (1929). Unfortunately he seems to have drawn it from memory and I feel it may be desirable to give a proper rendering of it, especially as, contrary to the opinion of other writers, I regard this painting as one of the most sacred and ceremonially important ones in Victoria. Why did the aboriginal artist only paint on this particular spot? If this design had no ceremonial significance, it would not be solitary. Other paintings, especially stencilled hands, would be on the walls of the shelter proper, or on the other innumerable huge boulders in the neighbourhood.

If this shelter were a frequented camping-place there should have been found in it the usual signs of aboriginal occupation: remains of food (in this case, bones), discarded stone implements, and char-

coal in quantity, Kenyon stated: "There is no sign of occupation though plenty of evidence of fires. A stone hammer and some chips were found in the shelter." Now Kenyon was a man who knew his camping-places, and had this been an extensively occupied one he would have recognized the evidence. He was the first ethnologist to see it, and he would have been able to note all the signs. There is one more point: water. The aborigines would not choose a camping-



"The Cave of the Serpent".
The painted rock-face is protected by a wire cage.

place far from water, and I have spent much time looking for it near this shelter, though unsuccessfully. Certainly there are birds in the vicinity, even bronze-wing pigeons, but there are also quite a lot of artificial dams and water-holes from which the sheep can drink. We don't know if the birds were there before the dams were built.

As can be seen by the illustration the principal figure in the painting is that of a man wearing a chignon and shown in profile, not full face, as Kenyon depicts him. In his hand he holds a snake, not a "disproportionately large boomerang". The tail of the snake ends at the nondescript design which is seen on the left. The round designs are water-holes or lakes surrounded by reeds. The two club-like objects are fish, perhaps eels, and the long, upright ladder on the right another snake.

Here I may be accused of having a very fertile imagination, and I am fully aware of the dangers of trying to identify an aboriginal design, but anyone familiar with the bark drawing from Lake

Tyrrell in north-western Victoria, incidentally the only bark drawing from south-eastern Australia known to be in existence (now preserved at the National Museum and of which there is an illustration in Brough Smyth's *Aborigines of Victoria*, vol. 1), would recognize the similarity of the rendering of the water-hole or lake, although in the case of the bark drawing it is surrounded by trees, and not by reeds. We must not forget that lakes are plentiful in the territory formerly occupied by this tribe, the Tjapwurong. The



Native Painting at "The Cave of the Serpent".
(Drawn from photographs.)

two club-like objects are exact replicas of two eels as drawn on a bark painting collected by Captain Carrington on Field Island, at the mouth of the South Alligator River in the Northern Territory, and exhibited in the rooms of the South Australian branch of the Royal Geographical Society of South Australia in Adelaide as far back as 1887, and reproduced at Plate 18 of Worsnop's *Prehistoric Arts*. This is possibly the oldest known bark painting. Eels, of course, were a favourite food of the aborigines, as witnessed by the

number of natives congregating at Lake Bolac and on Salt Creek in 1841 for the purpose of feasting on them, and reported by the Chief Protector, A. G. Robinson. The nondescript figure on the left, in which the tail of the snake disappears, is common in rock paintings in the Olary region of South Australia, although it is there generally rendered with the projecting parts upright. The same figure has also been reported from the Everard Ranges and from Mootwingee. Evidently it is the representation of some topographical feature, perhaps mountains or caves, or even outlines of stone arrangements on ceremonial grounds, such as the one at Lake Wongan, twenty miles or so to the south of this spot (see D. A. Casey in *The Victorian Naturalist*, vol. 54, 1938) and in the territory of the same tribe. It seems to me we are confronted with the pictorial rendition of a myth. The man holding the snake is extremely important, as it is the proof of the sacredness of the whole painting. The Tjapwurong, like all the other tribes forming part of the Mara "Nation", was divided into two totems or classes, the White Cockatoo and the Black Cockatoo, and these were again subdivided into sub-totems. One of the principal sub-totems of the Black Cockatoos was Kartuk or Kirtook, the Carpet Snake. Here we have a painting of Kartuk occurring on a rock shelter on the slopes of Lang-i-gherin, which in the native language means "the Home of the Black Cockatoo". Surely this is not just coincidence. This must have been the totemic centre for this faction of the tribe, and the painting a rendering of the myth connected with its origins. Robinson, the Protector of the Aborigines, here comes to my assistance, and supplies me with an indirect proof in support of my claim. In his report, dated July 20-25, 1841, he states: "The forms of two imaginary evil spirits, called by them Orokeet, a male and female, of whom they appear to entertain dread, were rudely sketched. Orokeet, they say, inhabits the mountains near Lar-nejeering." A pity he did not give us a drawing of the Orokeets, but would not this be a ruse to keep the uninitiated from the sacred mount? I feel sure there must be more such places on Langi Ghiran: the sacred places of the other sub-totems of the Black Cockatoo people.

There are in fact conflicting rumours about another, perhaps two or more caves. One Tom Wyse, a blacksmith, at Mount Cole almost one hundred years ago, was supposed to have discovered one not far from the "Hidden Lake" which lies in an elevated depression between Mount Gorriin and Langi Ghiran. This lake was a favourite drinking place for wallabies and other native fauna, and no doubt was also well frequented by the aborigines. Another report says that the cave discovered by Tom Wyse is in the neighbourhood of the precipitous cliffs on the eastern side of Langi Ghiran. Be it as it may, there can be little doubt that there are a number of such places awaiting discovery, especially in mountainous districts.

DESCRIPTION OF A NEW SPECIES OF BULBOHYLLUM (Orchidaceae)
FROM QUEENSLAND

By A. W. DOCKRILL and S. ST. CLAIR

BULBOHYLLUM REVOLUTUM Dockrill et St. Clair, Sp. nov.

Rhizoma rigidum. Pseudobulbi circa 7 x 6 mm, late ovoides, striati, distante, inter se ca. 6 mm. secundum rhizoma. Foliis ca. 15 x 8 mm, oblongum vel ovatum, rigidum, coriaceum, supra paucis canaliculatum, infra carinatum. Pedunculus constanter ca. 15 mm, longus, bracteis tribus vaginatis praeditus. Pedicelli solitarii sed saepius geminati, apicales. Ovarium tuberculatum. Flores non late patentes. Segmenta translucenta, lineis tribus fuscocarneis ornata. Sepalum dorsale ca. 6.5 x 2.5 mm, late ovatum, concavum, subacute, extirsecus sparse glanduliferum secundum lineas. Sepala lateralia ca. 6.5 x 4.5 mm, obliqua, oblongo-ovata, subacute, paucis falcata, concava, extirsecus sparse et indispote glandulifera. Petala ca. 3 x 2 mm, ovata vel obovata. Labellum fuscocarneum, ca. 3.75 x 1.5 mm, suboblongum, paucis decurrentem, concavum; in initia concavitate lamina subulata depresso-occupatum; marginis partis tertiae proximae labelli suberectae, sicut lobis indistincti; reliquiae margines revolutae (interdum paene convolutae); infra duo carinae parallelae, canaliculo angusto centrali separatae. Columna ca. 2 mm, longa usque postea 3 mm, longus et fero 90° ad eam declinatus; alae triangulares, marginibus superis interdum indistincte dentatis, stigma ovatum; rostellum prominent; anthera rotunda.

Holotype: North Queensland, Mt. Lewis, near Mt. Molloy

(F. Dyson-Holland, August 1955—Herb. N.S.W.).

Rhizome rigid. Pseudobulbs about 7 x 6 mm, broad-ovoid, fluted, spaced at intervals of about 6 mm. along rhizome. Leaves usually about 15 x 8 mm, oblong or ovate, rigid, coriaceous, slightly channelled above and keeled below. Peduncles constantly about 15 mm. long with 3 sheathing bracts; pedicels usually twinned, but occasionally solitary, at the apex of the peduncle. Ovary tuberculate. Flowers not widely expanding; sepals and petals translucent with 3 dark red longitudinal stripes. Dorsal sepal about 6.5 x 2.5 mm, broad ovate, concave, subacute, outer surface sparsely and irregularly glandular along the stripes. Lateral sepals about 6.5 x 4.5 mm, obliquely oblong-ovate, subacute, slightly falcate, concave, outer surface sparsely and irregularly glandular. Petals about 3 x 2 mm, ovate or obovate. Labellum dark red, about 3.75 x 1.5 mm, suboblong, slightly decurrent, concave, bottom of concavity occupied by a depressed subulate plate; margins of proximal third suberect (appearing like indistinct lobes), the remaining margins completely revolute (almost convolute); under surface with 2 parallel keels separated by a narrow central channel. Column about 2 mm. long, with a foot about 3 mm. long almost at right angles to it; wings deltoid, sometimes obscurely toothed on the upper margin; stigma ovate; rostellum prominent; anther rounded.

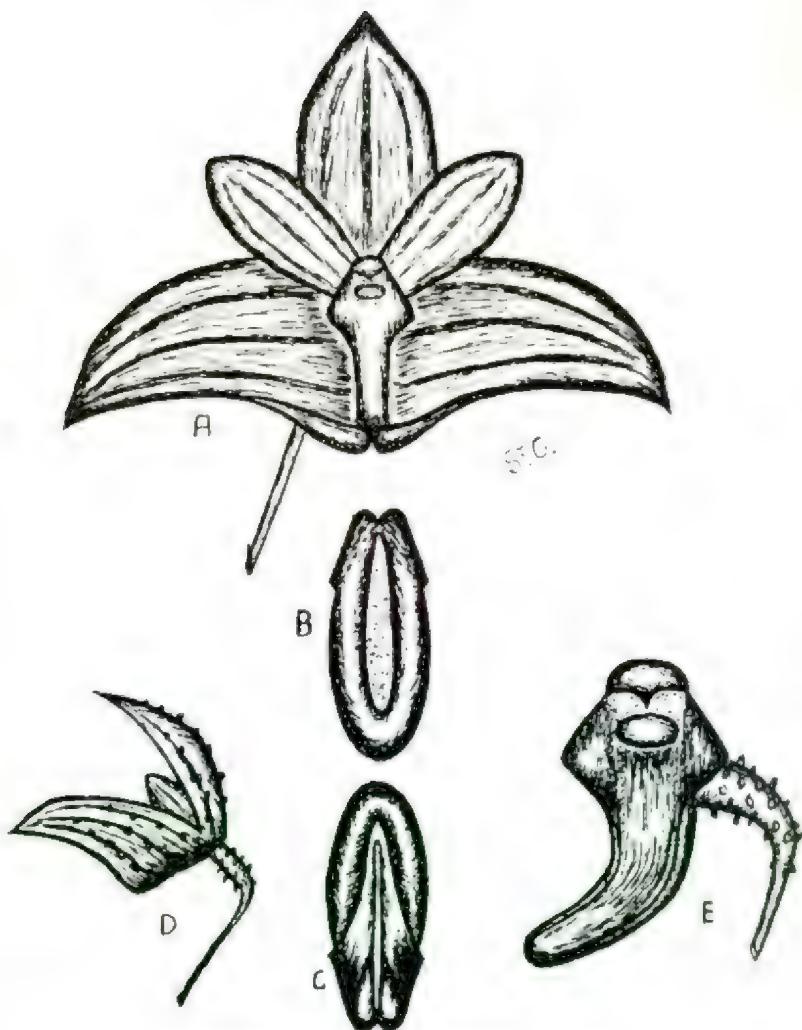
This species has affinities with *B. adenocarpum* Schdt., *B. lageniforme* F.M. Bailey and *B. liliaceum* Rendle, but it is distinguished from them primarily by its labellum: that of the first being convex and ridged, that of the second ovate and ridged and that of the third convex and greatly decurrent. It also has broader petals and leaves than the above 3 species and has 3 bracts on the peduncle as opposed to their solitary one.

The specific epithet refers to the margins of the apical two-thirds of the labellum.

EXPLANATION OF PLATE IV (page 68)

A. Flower from sturt, segments expanded, labellum removed; B. Labellum from above; C. Labellum from below; D. Flower from side; Column and Ovary. All figures variously enlarged.

PLATE IV



Bulbophyllum revolutum Deckn. et St. Cloud

See Explanatory of Plate in page 668.

NOTES ON XANTHIUM SPECIES, "COCKLEBURRS"

By P. F. MORRIS*

The species of *Xanthium* L. listed hereunder are poisonous to cattle, sheep, horses, pigs and poultry. A glucoside, known as xanthostrumarin, has been isolated from most of the species, and this substance is highly developed during the seedling stage but decreases towards the flowering period.

Since the early days of settlement in Australia, the number of cattle, sheep and other grazing animals has increased enormously, and today the pastoral industry is worth about £500-million each year. Losses caused by poisonous plants have always been recognized as fairly considerable, and doubtless many thousands of animals have suffered through grazing on the widespread Noogoora and Bathurst Burrs. A study of the residues from wool scouring mills in most parts of the world shows the great damage done to the woollen industry by the hooks on the burrs.

It is necessary to have uniformity in botanical naming, not only for the woollen, pastoral and manufacturing industries, but also for legal prosecutions under the noxious weeds acts. Noogoora and Bathurst Burrs are noxious weeds for the whole Commonwealth, and the former, which has been proclaimed as *Xanthium strumarium* L. for years, should probably be called *X. chinense* Mill.

The following is an abridged revision of the synonymy and localities for those species of *Xanthium* introduced into Australia and represented in the herbaria of the Royal Botanic Gardens, Kew (indicated as KEW below), and the British Museum of Natural History, London (BM).

1. *XANTHIUM SPINOSUM* L. Spiny Cockleburr or Bathurst Burr.

[Syn.: *X. xanthocarpum* Wallr.; *Acanthoxanthium spinosum* (Lour.)]

KEW: Tamworth, N.S.W., J. H. Boyle, 18/4/1951; opposite Riverview, Queensland, C. E. Hubbard, 9/11/30; Kingaroy, I. S. Smith, 15/4/47.

BM: Port Augusta, Rev. T. S. Lea, 1885-6; Morton Bay, Stuart, without date.

2. *XANTHIUM AMBROSOIDES* Hook & Arn. Horse Curse

[Syn.: *X. catharticum* Coste & Semen.; *X. spinosum* Baker; *X. eriocarpum* Wallr.; *X. leucocarpum* Wallr.]

KEW: N.S.W., near Jerilderie, J. T. Mackie, 23/4/43.

3. *XANTHIUM ORIENTALE* L. European Cockleburr.

[Syn.: *X. echinatum* Murr. non Willd.; *X. occidentale* Bert.; *X. italicum* Moretti; *X. riparium* Laseb; *X. canadense* Mill.; *X. americana* L.]

* National Herbarium of Victoria.

canum Walter; *X. pennsylvanicum* Wallr.; *X. californicum* Greene; *X. orientale* Cav.; *X. curvescens* M & S; *X. oriforme* Wallr. (See *Flora Illustrata Flora Ann. Mittel-Europae* 61, 498-502).]

KEW: Near Remark, South Australia, J. M. Black, 8/7/16, as *X. occidentale* Bert. (The fruits illustrated in J. M. Black's *Flora of South Australia*, p. 603, 1929, under the name of *X. californicum* Greene, are immature.)

The original specimens of this species in the Linnaean, Smith, and Hortus Cliffortianus herbaria are named *X. orientale*. I have sorted the collections at the British Museum and Kew herbaria and have made comparisons with the help of Messrs. Sandwith and Gannon of those institutions and the experts in *Compositae*, and they agree with my determinations. The available literature has also been studied.

4. *XANTHIUM CHINENSE* Mill. Noogoora Burr

[Syn.: *X. conadense* Fernald, and recent authors, not Mill.; *X. pungeum* Wallr.; *X. globratum* Britt.; *X. occidentale* Bert.; *X. longirostre* Wallr.; *X. inaequilaterum* DC.; *X. strumarium* M & Chase; *X. strumarium* Britt. & Brown.]

KEW: No. 6102, as *X. occidentale* Bert., Mareeba, North Queensland, coll. K. Domini, received Oct. 16, 1922 (Kew); Moreton district, C. T. White 11439, 12/5/40; Kingaroy, Queensland, L. S. Smith 3081, 16/4/47, as *X. pungeum* Wallr.; Gregory Downs Station, R. A. Perry, 9/6/48 (ex C.S.I.R.O., Canberra); Brisbane, J. L. Boorman, Dec. 4, 1899 (N.S.W. Herbarium as *X. chinense*).

The epithet, *chinense*, is a misnomer. The original locality was given as China, but this was subsequently corrected to Vera Cruz.

5. *XANTHIUM STRUMARIUM* L. Cockleburr.

I have not found any Australian material of this species in British herbaria, but a specimen in K.E.W. incorrectly labelled as *X. strumarium*, and collected by C. E. Hubbard at Wellington Point, near Brisbane, is a young form of *X. chinense*.

H. D. Harrington, *Manual of Plants of Colorado*, p. 618, 1954, says: "This is a difficult genus with numerous inter gradations. The last three species form a complex and perhaps should be united under one name." He refers here to some American forms of *X. pennsylvanicum*, *X. italicum*, and *X. orientale*. Moscoso in *Catalogues Florae Domingensis*, p. 693, 1943, records only *X. chinense* Mill. and *X. orientale* L. (Syn.: *X. echinatum* Murr.; *X. macrocarpum* DC., etc.)

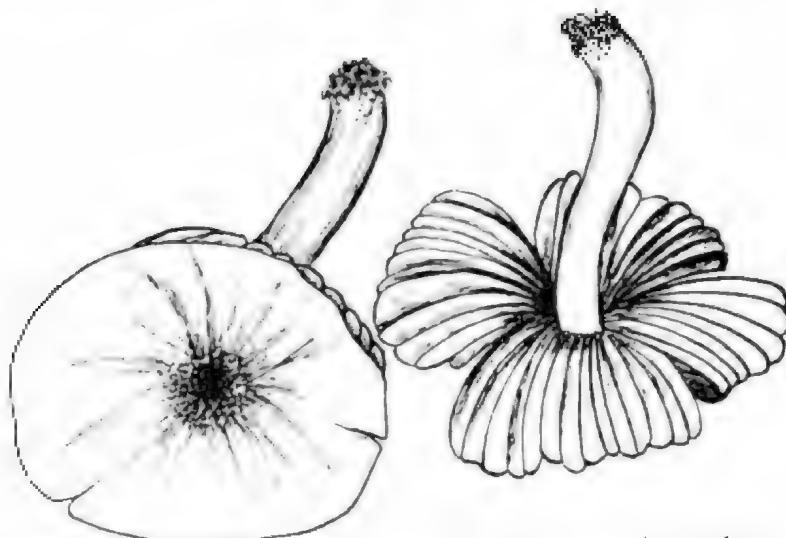
It is hoped that this article will assist Australian herbarium workers in the nomenclature of their material.

REDISCOVERY OF A RARE VICTORIAN TOADSTOOL

(*Hygrophorus lewellinae* Kalchbr.)

By J. H. WILLIS*

One of the most exquisite and colourful members of our agaric flora has been collected only twice, to my knowledge, and on both occasions by young ladies. For finding the lilac or violet-hued *Hygrophorus lewellinae* Kalchbr. again, after an interval of 76 years, honours go to Miss Rosemary Elsom—a pupil of the Melbourne C. of E. Girls' Grammar School, grand-niece of



(Natural size)

Traced from original painting
of HYGROPHORUS LEWELLINÆ
Kalchbr.by Miss M. M. R. Lewellin (at Tarwin, Vic., 14.6.1880)
—now in the National Herbarium of Victoria.

the former Director of Melbourne Botanic Gardens and an ardent young botanical observer. She gathered splendid specimens of it near the Bass Highway, Western Port (in sandy soil under scrub, above a road cutting and about 300 yards along the turn-off to Corinella) on July 7, 1936. Here is a brief description of an average specimen:

Pilus 3 cm. wide and 2 cm. high, conical and umboate, glabrous but apparently non-viscid, wholly pale violet fading to dull brown from the umbo outwards. *Stipe* concolorous, about 6 cm. x 6 mm., tense, glabrous, polished and lustrous, strongly fistulose. *Gills* concolorous to almost white near stem, slightly ventricose, adnexed and at length breaking free, moderately close. *Spores* white, 6.8 x 4.6 mic., smooth, gattulate, *Odeur* nil; *taste* mild and insipid.

* National Herbarium of Victoria.

Otherwise, the species was known solely by the type description (*Proc. Linn. Soc. N.S.W.* 7: 105 (1882)), drawn up in Latin by Rev. Carl Kalchbrenner from material collected by Miss M. M. R. Lewellin in June 1880, and named after her: presumably Baron von Mueller, a friend of the Lewellin family, had sent the notes and specimens to Kalchbrenner (in Wallendorf, Hungary) who stated that the toadstool was a "*Hygrophorus perlegans*... *lilacinus*", giving its location as Western Port. An English version of this diagnosis was published in M. C. Cooke's *Handbook of Australian Fungi*, p. 76 (1892).

In the Melbourne Herbarium are six rather stained sheets of paper containing 61 crude water-colour sketches of local fungi, made by Miss Lewellin during a visit to Mr. and Mrs. George Black at Tarwin, South Gippsland, early in the winter of 1880. No. 42 (on sheet iv) is undoubtedly *Hygrophorus lewelliniae*, fitting Kalchbrenner's description like a glove. The present whereabouts of that author's fungal types remains unknown to me; but, if they are lost, then Miss Lewellin's impressionistic but quite recognizable painting would become the ICONOTYPE of the species. My line-drawing (natural-size reproduction herewith) has been traced from Miss Lewellin's sketch, against which she has pencilled the following field notes:

pure pale blue—very delicate transparent colour—lilac over and under—
lilac stem—very tenile—in heathy ground among ferns—June 14th, 1880

Why Mueller, in submitting details to Rev. Kalchbrenner, should have specified "Western Port" instead of Tarwin is not quite clear. Perhaps he used the term in a wide regional sense, or perhaps Miss Lewellin's sphere of activity extended to the shores of Western Port Bay? In any circumstance, Tarwin is only about 32 miles E.S.E. of the now-definitely-known Western Port occurrence near Corinella, and this lovely gilled-fungus would seem to be endemic in southern coastal Victoria. Rosemary Elsom's plant has a smaller (about 3 cm.) pileus and slightly longer, more slender stipe than in the original collection; but such dimensional departures are quite trifling, and even the umbonate (not slightly umbilicate, as in type *H. lewelliniae*) feature of the pileus is no obstacle to specific agreement—Carleton Reb [British *Basidiomycetes*, 1922] describes the common cosmopolitan *H. mimitus* as "often umbonate, then umbilicate". The colour scheme of *Hygrophorus lewelliniae* is remarkably similar to that of *Cantharellus lilacinus* Clel., but this much more widespread toadstool (known also from Wonthaggi district, Vic.) has decurrent gills of a firm waxy consistency.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

SILVER GULLS AND A WHALE

About 1 p.m. on Monday, July 8 last, a whale reported off Black Rock was seen travelling towards Elwood. It dived and surfaced in rapid succession but spouted only after it had remained submerged for a long period. It appeared to be vigorous and active and we could follow its movements below the surface of the water by the actions of a flock of about 200 Silver Gulls which followed it, settling over it after it had submerged, but rising as it surfaced. The birds which then flew low down and around it were probably after the whitebait forced to the surface by the whale's manœuvres. It remained in this area for about two hours, moving slowly in a southerly direction. Whether its object was to clean itself of barnacles on the submerged reef, or take advantage of the existence of food, I cannot say.

—E. S. HANKE.

GROUND PARROTS NEAR PAYNESVILLE

On several occasions during the past eighteen years, I have disturbed a parrot (sometimes a pair) from among tussocks of grass on one or other of three small islands which lie approximately five miles south-east from Paynesville and four miles east from Sperm-whale Head. Observing them has been difficult because they fly for only short distance, and in a jerky and zigzag manner away from the observer. However, on April 27 last, I obtained an excellent view of one of them which perched for fully five minutes on a tussock about fifteen yards from me. It was nearly the size of a Rosella and mainly soft green in colour with the upper plumage flecked with black and the outer wing-feathers touched with pale yellow and blue. The tail was finely barred with black but the presence of a red spot on the forehead was a distinctive feature. These observations enabled me to confirm my previous belief that this species was the rare Ground Parrot, *Psephotus haematonotus*. Unfortunately these islands are too near the mainland to afford protection against foxes and indeed I have seen these marauders swim across the intervening channels. However, it is to be hoped that these rare birds will continue to find favourable nesting conditions in this locality.

—F. C. W. BARTON

REGENT HONEYEATERS

The three most common eucalypts around Stawell are Red Ironbark, Long-leaf Box, and Yellow Gum. This year the Red Ironbark flowered from February until May, and in April the Long-leaf Box began its heaviest blossoming for many years. Then in mid-June the Yellow Gum started flowering. These conditions were ideal for nectar-loving birds, and the usual population of honeyeaters, if not increased, was certainly more vocal and conspicuous. Red Wattle-birds with their harsh *staccato* calls and the Yellow-tufted, White-plumed, and White-naped Honeyeaters with their lesser, although sweeter, notes provided a day-long chorus. During the succeeding few weeks a new voice was added. The lovely Regent Honeyeater which had appeared earlier in June was now present in numbers and its mellow notes dominated the bushland chorus. As I listened to the muted bell-like calls around me I thought that I had enjoyed such an experience before, but I had never encountered more than an odd pair of Regent Honeyeaters until recently. Then I remembered that I had listened to the evening chorus of the Bird of Paradise on the northern slopes of the Owen Stanley Range in Papua. Unless my memory is false, there is a remarkable resemblance in both notes and call-habits of these two beautiful birds.

—I. R. McCANN.

A TRUE GUM FROM THE YACCA, *XANTHORHOEA SEMIPLANA*

An examination was made of the gum-like exudant on injuries to the scape of a Yacca, *Xanthorrhoea semiplana* F. Muell., collected by the writer in scrub near Meningie, South Australia, on April 28 last. "Grass-tree resin" obtained from the cemented leaf-bases of the closely allied *X. australis* R. Br. and other species, notably *X. latifolia* F. Muell. from Kangaroo Island, is used in the preparation of proprietary varnishes and stains. A. R. Penfold, in an article entitled "Grass-tree Resin" [Sydney Technological Museum Bulletin No. 16 (1931)], described the commercial product as "insoluble in water, but soluble in alcohol". The Meningie collections were tested and found to be insoluble in spirits and to swell and eventually dissolve in water. In weak solutions of sodium carbonate, the gum takes up the solution to become a thick and faintly amber-coloured mucilage. These properties are characteristic of a true gum, and the occurrence of the material on wounds of a *Xanthorrhoea* sp. is of some interest.

—L. D. WILSON

WHAT, WHERE, AND WHEN**F.N.C.V. Excursions:**

Sunday, September 15—Botany Group excursion to St. Albans. Take 10.45 train to St. Albans. Bring one meal.

Sunday, September 29—Parlour-coach excursion to Brisbane Ranges. Leader: Mr. I. Hammet. Coach will leave Batman Avenue at 9 a.m. Bring two meals. Fare: 18/-. Bookings with Excursion Secretary.

Sunday, October 6—Geology Group excursion to Romsey district. Details at next Group meeting.

Group Meetings:

(8 p.m. at National Herbarium unless otherwise stated.)

Friday, September 13—Botany Group. Speaker: Mr. Wilson. Subject: Native Plants in Cultivation (illustrated). The Group will meet at 8 p.m. in Mr. Lord's room at 514 Little Collins Street (between King and William Streets).

Wednesday, September 18—Microscopical Group.

Wednesday, October 2—Geology Group. Speaker: Mr. A. Blackburn. Subject: Igneous Rocks.

Monday, October 7—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms in Parliament House at 8 p.m. Enter through private entrance at south end of Parliament House.

Preliminary Notices:

Tuesday, November 5 (Cup Day)—Club picnic to Strath Creek. Leader: Mr. J. Ros Garnet. Parlour-coach leaves Batman Avenue at 9 a.m. Bring two meals. Fare: 17/-. Bookings with Excursion Secretary.

Saturday, November 16, and Sunday, November 17—Bendigo Field Naturalists Club visit to Melbourne. Programme: Saturday afternoon—Altona Salt Works (Leader: Miss I. Watson. Subject: Seagulls). Saturday evening—Evening at the Herbarium at 8 o'clock. Sunday—Excursion to Yellingbo (Leader: Mr. Hanks. Subject: Helmeted Honeyeater. The outing will conclude with a visit to the Healesville Sanctuary).

Thursday, December 26—Wednesday, January 1—Parlour-coach excursion to Genoa, East Gippsland. Leader: Mr. Wakefield. Headquarters will be at Genoa where hotel accommodation is available for £13/10/- for the six days. Excursions will be made to Mallacoota, Eden, Mount Drummer, and other places of interest. The bus fare will be £6/15/-, including the day trips, and there will be an extra charge of 10/- for a day trip in motor launches. Bookings (accompanied by £2 deposit) should be made as soon as possible with the Excursion Secretary.

Victorian National Parks Association:

Wednesday, September 25—The Annual Meeting of the Association will be held at 7.45 p.m. in the Museum Theatrette, Latrobe Street, Melbourne. Members of this Club who are not members of the Association are cordially invited to attend.

MARIE ALLENDER, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7

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PROCEEDINGS

Mr. J. R. Garnet occupied the Chair and about 100 members and visitors attended the General Meeting at the National Herbarium on September 9.

The President referred with feeling to the passing of Mr. George Coghill and gave an outline of his 75 years' membership and 60 years as office-hearer of the Club. He reported also the death of Mr. David G. Stead. Members stood for a minute as a tribute to their memory.

Mr. A. D. Butcher addressed the Club on "Conservation and Management of Wild Life", illustrating his talk with slides of some conservation projects in U.S.A. and Canada. An enthusiastic vote of thanks was carried.

The meeting approved of the appointment of Mr. Robert Davidson as a Club Auditor.

The President congratulated Mr. H. P. Dickins, as it was his 85th anniversary.

Miss M. F. Crommelin of Pearl Beach, New South Wales, and Mr. O. Peuker of Horsham were elected as Country Members.

Mr. E. H. Coghill commented on an exhibit of pressed wild-flowers collected by Mr. George Coghill in 1886 and lists of those collected at Brighton and Cape Woolamai respectively.

Other exhibits included a "Green Snail" and two opercula collected by Mr. George Coghill in New Ireland in 1923; *Hovea longifolia* from Beenak (Mr. Haase); flowers from about Boronia Peak in the Grampians (Mr. E. Allan); leaves and fruit of Bitter Quandong, *Santalum murrayanum*, from the Victorian Mallee (Mr. E. Hanks); *Azolla filiculoides* (Mr. J. R. Garnet); and garden-grown native flowers by various exhibitors.

BENDIGO F.N.C. VISIT TO MELBOURNE

The following programme has been arranged for the visit of the Bendigo Field Naturalists Club to Melbourne on Saturday and Sunday, November 16 and 17:

Saturday Afternoon—Visit to Altona Salt Works. Leader: Miss Ina Watson (Secretary of the B.O.C. Altona Survey Group). Subject: Seagulls and Waders. Transport will be by private cars, and members are to meet at 1.30 p.m. at the loading ramp, opposite C.T.A. Building, in Flinders Street (west of Elizabeth Street).

Saturday Evening (8 p.m. at National Herbarium). Speaker: Dr. Margaret Chattaway (Forest Products Division, C.S.I.R.O.). Subject: *Those odd*

eucalypts. Members are requested to bring a small plate for the supper which will conclude the evening.

Sunday--Excursion to Yellingbo. Leader: Mr. E. S. Hanks (Convener of the B.O.C. Helmeted Honeyeater Survey Group). Subject: The Helmeted Honeyeater. The day will conclude with a late afternoon visit to the Sir Colm McKenzie Sanctuary, Healesville. Transport will be by private cars and parlour-coach which leave from outside Ball & Welch, Flinders Street, at 9 a.m. Fare 18/-, bookings with Excursion Secretary. Bring two meals.

THE CHALICUM BUN-YIP

By A. MASSOLA*

Of all the myths known to the natives of Victoria, none was more believed and yet had less amount of detail, than the story of the Bun-yip. Indeed, under different names, this fabulous monster was known to most of the southern tribes. Some of the early settlers, too, claimed to have seen it, and William Buckley, the runaway convict who lived with the aborigines for thirty-two years, mentions it frequently in his *Life and Adventures* as related to, and published by John Morgan in 1852. He even states: "When alone, I several times attempted to spear a Bun-yip", of which he says that he could never see any part of it except the back, "which appeared to be covered with feathers of a dusky-grey color", and "seemed to be the size of a full-grown calf." Brough Smyth, in his *Aborigines of Victoria*, gives two illustrations of the supposed Bun-yip, one a tolerably good representation of an emu, made by Kurruk, a Western Port black, and the other a nondescript animal drawn by an aboriginal of the Murray River. Regarding this latter Bun-yip Brough Smyth states: "The coating of the animal is either scales or feathers; but in truth little is known amongst the blacks respecting its form or covering, or habits. They appear to have been in such dread of it as to have been unable to take note of its characteristics." This last statement just about answers the whole field of inquiry respecting the nature of this animal. Only on one point did all the tribes agree: it emitted terrifying bellowings.

Not generally known is the legend of a Bun-yip that had died, or was speared (there are two versions of the story) on the banks of the Fiery Creek at Challicum Station, near Ararat. It is with this particular Bun-yip that we are concerned in this paper. The story begins when George Wingfield Thomson, a young sea captain, settled on Charley Combe Creek in 1840, and built there the original wooden portion of the Challicum homestead, in the semblance of the cabin of one of the ships he loved so much.

Previous to his occupation of the land, Charley Combe Creek appears to have been the boundary of two groups of the Tjapwirong Tribe, the Moorcherrak to the west and the Werruperrong to the

* Curator of Anthropology, National Museum of Victoria.

east. Unfortunately, there are no records of Thomson's dealings with the aborigines, consequently, we do not know if he was aware, at this early date, that not far from his home the Bun-yip had his domain. However, in July, 1856, Mr. W. H. Wright, then Commissioner of Crown Lands for the district, heard from the natives that the figure of a Bun-yip had been traced long ago around the carcass of one of these animals, and that they, the natives, visited the spot occasionally to re-mark the figure, which was about thirty feet in length. The locality was said to be about half a mile from Challicum Station, on the banks of a creek. Mr. Wright informed a friend, Mr. R. E. Johns, Clerk of Petty Sessions at Moonabel, and gifted with an insatiable curiosity for the habits of the aborigines, of what he had heard. This latter gentleman was able to obtain from Mr. T. W. Scott, who was the overseer of the Challicum Station, a sketch of this Bun-yip figure and a locality plan. These sketches (Plate V and text figure p. 79), were made in 1867.

Luckily, the National Museum of Victoria possesses the notebooks in which Mr. Johns entered all the scraps of information he could obtain about antiquities, not only of Victoria, but of the whole world. In his No. 1 of 6 voluminous tomes, he carefully inserted Scott's sketches, and added the following in his own hand writing:

Bun-yip.—A belief in the existence of some gigantic, aquatic, and carnivorous animal in deep water-holes on creeks is universal. Among the Aborigines of Victoria, South Australia and New South Wales they call this animal "bunyip" and cannot be induced to bathe in the holes it is said to frequent. Many Europeans, especially in the Mount Remarkable district of South Australia, also aver that they have seen it. At Challicum Station, near Ararat, Victoria, a figure is cut on the turf on the banks of the creek (see rough sketch attached) which the natives say was drawn long ago round the carcass of one of these animals as it lay there. I first heard of this figure in July, 1856, from Mr. W. H. Wright, Commissioner of Crown Lands at Geersley on the Wimmera. He told me that the aborigines were in the habit of visiting the place annually and tracing and clearing the outline of the figure afresh. I have since learned that the large water hole near it is said to be still haunted by a bunyip, and that an old shepherd positively asserts that he once saw it, and will not even now (1867) leave his hut after nightfall.

Mr. Johns must have sent a copy of the sketch to Thomas Worsnop, Town Clerk at Adelaide, for in this latter gentleman's work, *The pre-historic Arts, Manufactures, Works, Weapons, etc., of the Aborigines of Australia*, which was printed in Adelaide in 1897, he retells the story much as above, but states that the sketch which Johns sent him was made in 1876. This must be an error, unless, of course, he received it on that date. Regarding R. E. Johns' subsequent career, the following may be of interest: Clerk of Petty Sessions at Moonabel, 1862; Registrar of County Court at Stawell 1876; Chief Clerk of the Court of Insolvency, Ararat, 1883; Police Magistrate at Shepparton, 1888. Services terminated in 1903 when



he was Police Magistrate at Hamilton, where he died in 1910. George Wingfield Thomson never returned to the sea, but lived at Challicum until his death in 1897. By this time Challicum had become one of the most successful sheep stations in the Western District. At his death the property passed on to his two sons, who, however, did not long survive him, and with their demise it changed hands, and later was subdivided into two properties, Challicum and Challicum South.



Locality Plan.

The next document came to me through the kindness of the present owner of Challicum, Mr. J. E. B. White, who obtained it from a friend of his in Sydney. It is a newspaper cutting here reproduced on Plate VI. Fortunately, this friend had seen it just in time to save it from the fire, but it was by then already in the present condition. All efforts to trace the name of the newspaper from which it came have been in vain. However, Mr. White was able to ascertain that Enoch R. Scott was a direct descendant of the Scott who was overseer at Challicum in Thomson's time, that he was born there and

later moved to a station in New South Wales which he named Challicum, after his birth-place, and that he had subsequently died, leaving some children, who in turn, left the property and are now living in a Melbourne suburb. They, of course, know nothing of the Challicum Bun-yip. With all the facts before us let us now examine what is left of the evidence.

THE BUN-YIP MYTH

There appears to be little question of the occasional appearance of an animal in inland waters with which the aborigines were not familiar. Everything points to this animal being the South Eastern Australian Fur Seal, sometimes called the Eared Seal. It belongs to the species *Arctocephalus tasmaniensis* Scott and Lord and is not a true seal but a sea-bear. Unlike the seal proper, it has well formed ears, and loudly bellows or roars. It is as much at home in fresh as in sea water, and it has been observed by reliable witnesses miles from the sea. There are authentic records of seals having been seen in Lake Coranganite in 1872, and at a later date in Lake Burrumbat, near Ballarat. One was captured some thirty miles up the Shoalhaven at its junction with Kangaroo River, about eight miles from Bundanoon (N.S.W.). Another seal captured in the same river was found to contain a fully-grown platypus in its stomach.

It is true that the coastal tribes must have been familiar with seals and often made a meal of them, for seal bones are common in coastal middens; but inland tribes, although no doubt they would have heard reports of them, would be startled by the sudden appearance of one at a water-hole, or in hearing the unfamiliar bellow. Such an apparition would most certainly strike terror into the heart of the superstitious natives, and the no less superstitious, often illiterate, shepherds who tended the flocks in the newly occupied "runs".

As a matter of fact, both the Bun-yip of Kurruk, as illustrated in Brough Smyth's book, and the Challicum Bun-yip, by the simple process of imagining the heads where the tails are shown, or vice versa, and by turning the legs into flippers, would make tolerably good sketches of seals. If the originals were seals, or sea-bears, how easily they could be changed into the familiar emu by the native trying to draw an animal about which he had heard only vague descriptions!

THE ABORIGINES

It is amazing how little we know of the Aborigines of the Western District, but hardly surprising when one remembers how soon the country was occupied after its discovery, first by the squatters and later by the gold-diggers. Major Mitchell travelled through the Ararat district at the end of 1836. He reported only small parties of natives, the largest being about forty blacks, who advanced towards

the camp in a threatening manner. This would be in keeping with what we know about aborigines as they split up into numerous family groups, each keeping to its own territory and coming together only at corroborees. But there is no doubt that the district supported a large population, as game and water were plentiful, while the open plains were thick with edible roots. By 1840 the district had been occupied by the squatters who, with few exceptions, regarded the aborigines much in the same way as we regard the rabbits today. They were a nuisance and were ordered, sometimes shot, off the "runs". Deprived of their hunting grounds it was not long before they were reduced to live by stealing, begging and prostitution which, with the attendant corollary of diseases, soon decimated them. During the winter of 1841 A. G. Robinson, the Chief Protector of Aborigines, visited the remnants of the tribes. Already they were badly reduced in numbers, but he estimated that, just prior to his visit to Lake Bolac, almost one thousand had assembled there for the eeling season. These numbers of course were made up from innumerable tribes, as the owners of the Lake, the Booluc-burrs, were fewer than eighty. By 1855 the first gold-diggers had arrived in the district, although the Golden Epoch did not begin until 1857. These men pushed on over the hills and the inaccessible places in which the squatters were not interested, and penetrated the last strongholds of the tribes. By 1866, the total remnants of the Mount Sturgeon, Hopkins River and Mount Cole Tribes were estimated at thirty-six men, women and children. The last Fiery Creek black, Tommy Ware, died in 1886.

The end had come so quickly that there was not time to record very much about them. As in other aboriginal tribes, no doubt the only well-informed persons were the Elders. Most of these would be amongst the first victims, Tuurap Warneen for instance, principal headman of the Mount Rouse (Kolor) Tribe, was shot by the manager of the local station. With the Elders passed the knowledge of which they were the only possessors.

THE BUN-YIP GROUND DRAWING

Ground drawings have been reported from all the States, and Victoria we know of only three. One was the "Heart" found cut in the soil near Sale in Gippsland, where the homestead of a station by that name stood. Then there was the "Horse",* or at least an animal that resembled one, cut on the banks of the Hopkins River, near Wickliffe.

Then, of course, we have the Challicum Bun-yip. It is obvious, from the two drawings of it we possess, that the animal was either

* Incidentally, the present writer would like more information about this "Horse" and should anyone know about it would they please communicate with him at the National Museum. ,

PLATE VI



THE BUNYIP OF CHALICUM, VICTORIA.

The Bunyip

AN old-time instance of aboriginal art has recently come under my notice in an article in a very dilapidated newspaper clipping dealing with the bunyip, "a mysterious monster of undefined shape and size which is supposed by the blacks to inhabit the deep pools of Australian rivers." Such a legend existed among the natives of the "Challicum" locality, and a ground carving existed on Fury Creek, about 6½ miles from the station owned by Messrs. Cooper and Thompson near Ararat, Victoria. The locality is a treeless plain; a little stream flows through the grass, and here expands into three large, deep waterholes, a small thicket of scrubby and grotesque gum-trees hanging over one of these pools. The tradition is meagre in details, but the blacks said that one of the waterholes was inhabited by a bunyip, which one day got hold of a blackfellow and devoured him. The other blackfellows, seeing this, speared the bunyip and dragged him out of the lake. As he lay on the grass beside the pool they marked his outline on the turf, and afterwards removed the soil with their marks, leaving an outline of the monster on the ground. As to the time, the blacks could only say it was a long time ago. The dimensions of the outline are given as 12ft from head to tail, although there is a discrepancy there, as the sketch shows 21ft. The natives maintained that many bunyips still exist in other waterholes, so that we are not allowed the hypothesis of an extinct species; nor does the monster appear to have anything in common with the huge amphibious scutsons of the pre-Adamic world. The story of the bunyip is perhaps the only extant memory of aboriginal mythology, the only analogue in Australia (so sterile of romance) to the beautiful myths of Greece, to the gorgeous imaginations of Oriental fancy, to the fantastic creations of our own fairytale land of the north.--Enoch R. Scott

an emu, or, more likely, a seal. It possibly was speared, or died through natural causes, on the banks of one of the water-holes not far from Challicum Station. The natives who speared it, or found it dead, traced the contour of it in the turf, and of course, promptly incorporated it in their legends, and revisited the place periodically during their initiation ceremonies to re-enact this legend. It was at such times that the younger generations were instructed on all the knowledge in sacred matters possessed by their elders. No doubt, the drawing was visited by the elders of the tribe some days previous to the ceremonial time for the purpose of cleaning it and cutting it afresh. Each time it was cut in, it necessarily got a little larger, until it attained the reported length—eleven paces. Also, each time it looked a little less like it did when originally cut.

The two sketches of it which we possess do not agree in size, or even in shape. Worsnop's description tallies with Johns', and there seems to be little doubt that Johns sent him an exact copy of the one reproduced here (Plate V and text figure). Plate VI must have come from a different original, also there must have been a different text with it, because Enoch R. Scott refers to a discrepancy in his dimensions. However, these details, although of great interest, are not really important, the important part being the recording of the ground drawing at all.

The exact location of the drawing does not agree with the sketch: Johns says "about half a mile from Challicum Station". This seems to be incorrect, because local tradition has it that the drawing was on the banks of a water-hole, now known as the Black Water Hole, which is about 700 ft. south-east of where Challicum South homestead now stands, about four miles from Challicum station. It is possible, of course, that there may have been an outstation on the site now occupied by the homestead. Challicum South is on the Fiery Creek, which was known to the aborigines as Pare-in-gid-yalla, Rapid Floods, but this may have been only the name of a section of it, as it is well known that the natives preferred to name individual water-holes, in preference to the whole creek, especially if, like this one, it had the habit of drying up in the summer, and only leaving the water-holes. Yalla-y-poora, was another name for Fiery Creek, but this was further north from Challicum South, while south of it, it seems to have been called Pracknin-jerring.

However, to come back to the Bun-yip. It is not surprising to hear that the natives finally abandoned it: There were no natives left! The spot on which the drawing was cut was kept fenced off for a while, then the grass grew, and the outline became indistinct. Finally, it was decided that keeping a lot of grass fenced off served no useful purpose; so the sheep were fed on it, and their hoofs completely obliterated what was left of the drawing. The Challicum Bun-yip had rejoined its makers, the Tjapwurong.

A CENTRAL AUSTRALIAN HOLIDAY

By ANNETTE CUMMINS, Firbank C.E.G.G.S.

{ Read before the Hawthorn Junior F.N.C. on February 22, 1957 }

What better way is there of spending a school holiday than by taking a trip to Central Australia? It provides an opportunity to see some of Australia's original inhabitants, the aborigines, in their native state; to observe the vastness and to appreciate the unique colourings and structure of our great continent; to study at first-hand the flora and fauna; and to realize the tremendous difficulties which have been overcome during the last century in order to establish missions, educational facilities, hospitals and reliable transport and communications in a region of such climatic extremes.

Our party, consisting of seventeen schoolgirls and two mistresses, embarked for Adelaide on Saturday, August 25, 1956, on the first stage of our train journey to Alice Springs. It was not until we reached Pirie Junction, north of Adelaide, that we began to realize Australia's gauge problem. Here we changed from 5 ft. 3 in. to 4 ft. 8½ in. Further north, at Copley, we again changed—this time to 3 ft. 6 in., which is the gauge for the rest of the line terminating at the Alice. The train travelling between Copley and Alice Springs is affectionately known to all as the "Ghan". It is a mixed passenger and goods train with a modern diesel engine and was named after the Afghans who drove camel-trains into the Centre with supplies at the end of last century.

The scenery from the Ghan was ever-changing. Low hills rose out of a sea of red sand only to become insignificant in the vastness of the landscape. Many deserted stone houses, now falling into ruins, and the bleached bones of dead animals served as symbols for the many courageous families who have been unable to survive the tremendous hardships surrounding them. Places with impressive names on the map usually consisted of a house, a tank and a sign post, and separated from one another by miles of dry, barren, and lonely country. Lake Eyre from the train appeared as a narrow shimmering line on the horizon and it was not until we flew over it on our return that we realized its vastness.

Fortunately, as the train was constantly breaking down, we were able to collect many specimens of wildflowers, which, due to the exceptionally good season, were numerous and varied. At times the red soil was partly obscured by a carpet of yellow daisies or purple parakeelyas, or the ground was dotted with yellow paddy-melons, grey green salt-bush or clumps of prickly spinifex. At each stop we collected a small sample of sand and it was interesting to observe the changes in texture and colour that occurred over even a few miles.

It was not until we had crossed the border into the Northern Territory that we caught our first glimpse of Australia's inland fauna. As the train journeyed onwards kangaroos hopped away, and on one occasion we saw a pair of emus stalking across the line and a dingo making for cover.

On the third day after leaving Adelaide we arrived at Alice Springs. We left immediately for Palm Valley which is situated 100 miles south-west of the town. As we bumped over the seemingly impassable tracks in a four-wheel-drive coach, the landscape held our attention as the orange ball of the sun gradually sank behind the jagged outcrops of the Macdonnell Ranges. When the sun had gone the ranges formed a black silhouette against the greenish-blue of the sky. In the early morning sunlight at Palm Valley on the following day, the sand was a most beautiful red in contrast with the green of the gums along the dry creek-bed and with the purple of the cliffs encircling the camp.

While we were walking the two miles to Palm Valley itself we passed numerous small rock pools and the "Lone Palm" before passing through the Cycad Gorge into that part of the valley from which the place receives its name. It is a tropical paradise with a forest of palms, *Litsea mariae*, towering overhead and with bright wildflowers growing around the edge of the rock pools below. After the hot walk back we went "swimming". We all bravely entered the deepest part of the pool—just up to our knees! The water was freezing when compared with the heat of the bare rock around the pool.

Another day was spent in climbing Battleship Rock, which forms part of a semi-circle of ranges making up the Amphitheatre. Battleship Rock is an excellent example of the many geological formations in the Territory which are named because of their resemblance to some object. Other examples are the Sphinx—a piece of rock jutting out from the range—and the Kangaroo Tail at Ayer's Rock. We had to be assisted by two guides when climbing Battleship Rock, but the panorama from the top was well worth the effort and anxiety of the climb.

On our return from Palm Valley we visited Simpson's, Emily, and Jessie Gaps and Standley Chasm, all of which are situated in the Macdonnell Ranges. Of these, Standley Chasm was the most memorable. It seemed as if a giant knife had cut a parallel slab several feet wide out of the range. At midday the sun shone directly down the chasm and the sides reflected their deep orange colour. We climbed high up the chasm into the valley beyond and on looking back the view was breathtaking.

Several places in the Alice serve as a reminder of the work of the Rev. John Flynn. The Flynn Memorial Church, designed to represent an aeroplane, was recently built in his honour and the entrance

to it is under a "wing" over a pool of water which symbolizes the outback's greatest need. At each end of the interior wall is a sand-stone shield. At one end the shield reaches to the roof, while at the other it touches the floor, signifying that though Flynn had his head in the clouds he was, at the same time, very much down to earth. We also saw Connellan's Airways which is the base for the Royal Flying Doctor Service planes, and the Flying Doctor Base where there are models and pictures of early planes and pedal wireless sets. We finally paid our tribute to the Rev. Flynn by visiting

his grave, which is situated two miles out of the town in the shade of his beloved Mount Gillen.

We flew to Melbourne via Oodnadatta after ten wonderful days. We were interested to note that the time taken to fly over four States was four hours, instead of the two and a half days required to cross one and a half States by train!

On our return we took stock. When the films were developed there were some excellent colour slides, and numerous black-and-white snaps there was a collection of some thirty insects, another of about one hundred plants and another of many rocks and soils collected



Twin Ghost Gums, N.T.

at various places. Of the insects, three species are not named and two specimens have been given to the Melbourne Museum. Similarly, there were two botanical species which are possibly undescribed and six specimens have been given to the Melbourne Herbarium. In addition, there were such odds and ends as the pelvis of a euro, the jaw of a dingo, and shells from the time when Palm Valley was under the sea. As a reminder of the native population many of us brought back originals and prints of artists' works and boomerangs, hunting and killing sticks. These things, together with our many memories, will always serve as a vivid reminder of the Central Australian trip of our schooldays.

VICTORIAN RECORDS FOR SECOTIUM

(A remarkable genus of fungi in the Gasteromycetes)

By J. H. WILLIS*

The gill structure in an occasional toadstool may be so malformed that the whole fruiting-body bears little resemblance to a normal specimen of the same species. Such aberrant fungi are rarely collected and preserved; but, in disregarding what is believed to be merely some gilled fungi "gone wrong", one is in danger of throwing away an important record in the little-known genus *Secotium*—close relative of the puffballs, and far removed systematically from the true agarics.

Members of *Secotium* have a long or short (sometimes very short) central stipe, continued as a columella through the cap-like peridium. This peridium often ruptures around the insertion of the stipe, to expose part of the spore-bearing tissue—irregularly anastomosing trama plates, enclosing large or small cellular cavities. Even as late as 1926 E. Gaumann placed these fungi in the order *Agaricales*; but Dr. G. H. Cunningham remarks [in *The Gasteromycetes of Australia and New Zealand*, p. 78 (1944)]:

The taxonomic position of the genus has proved a problem to most workers. . . . The method of development and indehiscent-persistent cellular gleba indicate that it is a Gasteromycete. . . . In the majority of species the gleba is typically cellular, one or two, however, have the trama plates so arranged that the cells are greatly elongated. . . .

An extreme expression of the lamellar condition is seen in *S. nygarioides*, where the trama plates are sparingly anastomosed and arranged, like the gills of an agaric, vertically around the columella.

He assigns them to the order *Hymenogastrales*, in Tulzine's family *Secotiaceae* which contains the single genus *Secotium*. About 38 species are at present known throughout the world (excepting northern Europe and Great Britain), and all but one of the 17 occurring in Australasia are endemic—*S. nygarioides* ranges through southern Europe, North Africa, Asia and North America; it may be introduced in the two Australian localities ("W.A." and Green Hill Rd., S.A.) recorded by Cunningham (*l.c.*).

Since 1944, two more endemic species have been described. *S. concinna* (as "*S. canari*") by Professor Roger Heim from Akaroa in New Zealand [Rev. Mycol., Paris 162: 142-5 (Sept. 1951)], and *S. fragarinum* G. H. Cunningham from Cascade Bay on Norfolk Island [Trans. Roy. Soc. S. Aust. 75: 14-15 (1952)]. Several of the 8 species in New Zealand are brilliantly coloured—scarlet, violet, blue or greenish—but the 10 Australian representatives (8 being endemic) are mostly drab grey or brownish plants.

Only two collections seem ever to have been recorded for Victoria, viz., *S. leuccephalum* (from Cannadas near Bacchus Marsh), and *S. sebastinum* (from the Domain, Melbourne); the former is housed in the herbarium of the Botany School, Melbourne University, and the latter—a fragmentary type—is at Kew, England. No Victorian specimen of *Secotium* is in the fungal herbarium of the Plant Research Laboratory (Dept. Agric.) at Burnley, Vic., nor is the genus represented in the National Herbarium at South Yarra, Vic. During the past two decades, however, six other collections of *Secotium* have been made in this State and, as four additional species are concerned, it is now desirable to list all Victorian occurrences:

1. S. : AGARICOIDES (Cesni.) Hollós: Mildura, on a buffalo-grass lawn (J. H. Willis, May 1937).

This collection has unfortunately been lost, and spore details are lacking from the writer's description of the fresh plant; but all other features agree

* National Herbarium of Victoria

with those ascribed to *S. agaricoides*, and he has little doubt that the identification was correct.

2. *S. COARCTATUM* Berk.: Arnold West near Rheola (*H. Watts*, June 1938—Herb. J. H. W.; *H. Watts*, May 1939—Herb. Univ. Melb.).

Previously known from all the other States excepting Queensland (type was from Swan River region, W.A.). It is said to have a strong but agreeable odour when fresh.

3. *S. LEUCOCEPHALUM* Masscc.: Coimadai (*S. G. M. Everett*, ca. 1936—Herb. Univ. Melb., det. & refer. G. H. Cunningham 1944).

Occurring also in South Australia and New Zealand (type from Auckland).

4. *S. MELANOSPORUM* Berk.: Walpeup Agric. Research Station (June 1955 Herb. Univ. Melb.); Abbotsford Bridge, on Murray River between Mildura and Wentworth, N.S.W. (*J. H. Willis*, Aug. 1955—Herb. J.H.W.).

Both collections were determined by G. H. Cunningham. The species is otherwise recorded from Western Australia (type locality in Swan River region), South Australia and New South Wales—chiefly in dry sandy places of the inland.

5. *S. RODWAYI* Massee: Mt. Dandenong, on W. Rickett's property (*Thebna Daniell*, Mar. 1957—Herb. J.H.W.).

This almost stemless little fungus had very minutely verruculose spores about 6 mic. in diameter. The species was known hitherto only from Tasmania (type area) and two collections in the Mt. Lofty Ranges, S. Aust. It is almost subterranean, and seen only when scratched out of the humus-rich soil by burrowing animals.

6. *S. SCABROSUM* Cooke & Masscc.: The Domain, Melbourne (*E. Mueller*—TYPE in Herb. K.).

The species is known only by its rather fragmentary type.

Key to Six Victorian Species of *Secotium*

Peridium glabrous; gleba rusty-coloured, the cells to 3 mm. long; stipe slender, 1-2.5 cm. long; spores verruculose, elliptical, 9-11 x 5-7 mic.
—*S. lencacephalum*.

Peridium minutely woolly or scaly.

Gleba dark sepia brown or almost black; spores quite smooth, subglobose. Peridium about 3-4 cm. high, with stipe to 4 cm.; gleba cellular, the cells minute (4-5 per mm.); spores 6-11 x 4-8 mic.
—*S. melanosporum*.

Peridium to 8 cm. high, with short or obsolete stipe; gleba lamellar throughout; spores 5-9 mic.
—*S. agaricoides*.

Gleba ochre, tan or rusty-coloured; stipe short, less than 2 cm. long. Spores quite smooth, globose, 5-10 mic.; gleba cells minute (4-5 per mm.).
—*S. coarctatum*.

Spores finely verruculose, globose, 6-10 mic.; gleba cells 1 mm. long (almost stipelless plant).
—*S. rodwayi*.

Spores coarsely verruculose, ellipsoid. 16-18 x 8-10 mic.; gleba cells to 3 mm. long.
—*S. scabrosum*.

[The author desires to register his indebtedness to Dr. G. H. Cunningham, who kindly checked the identities of several collections cited above, and whose excellent monograph on the Australian and New Zealand *Gastromycetes* has proved an invaluable guide at all times.]

MORE NATIVE BIRDS NOW PROTECTED

In a Proclamation which comes into effect on September 4, 1957, five more native birds are now protected for the whole year in Victoria. This was announced by the Director of the Fisheries and Game Department recently.

The majority of our native birds are protected already, and the birds now added to the list are Zebra, or Chestnut-eared Finch, Red-browed Finch (Waxbill), Crimson Rosella, Eastern Rosella, Australian Pelican.

Finches.—Previously both the finches were protected over the breeding season, but could be taken for aviary breeding during the rest of the year. The Fisheries and Game Department feels that aviary stock for the two finches should have become well established and that these birds should now have complete protection in the native state.

Rosellas.—These lovely parrots deserve protection all the year round for the interest, colour, and beauty they bring to the countryside. It is realized that at times these birds can become a problem in orchards, but the position will be met by the Department taking a lenient view on the question of issuing permits for control where it is proved the birds are causing economic damage.

Pelican. When the original Game Acts were being prepared the Pelican was not protected, presumably because of its fish-eating habits. The Fisheries and Game Department feels that the Pelican does not present any real threat to fisheries and deserves complete protection. It is not sufficiently numerous to be a major factor in fish destruction.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

NOTES ON SEAGULLS

It has been noticeable over the past few weeks that large flocks of seagulls have been flying inland. According to the *Northcote Leader Budget*, some have been congregating in Haxby Park, Bell Street, Preston, about eight miles inland. The *Herald* also reported that flocks of gulls were flying over Keilor, nine miles from the Bay, and following the ploughs. A wife of a market gardener, who has lived there forty years, has never seen the gulls in such numbers. At Westgarth I have watched them passing overhead, presumably to and from their new feeding grounds, and have been surprised to see some groups in excellent "V" formation. I had always thought of gulls as haphazard, individual and independent fliers rather than gregarious. Perhaps for high long-distance flying, they need a navigator-leader. When the birds are in formation they fly silently and purposefully, and when cries are heard they come only from the unorganized masses. What could be the reason for this inland invasion? The weather has not been consistently rough. Could it be that fish are scarce and the numbers of seagulls are growing, so that the birds must supplement their fish diet with worms?

E. I. MUNISON.

WEDGE-TAILED EAGLE TAKES A FOX

Shortly after Easter this year, Mr. Noel Griggs, who is a trainee at the Apprentices Training School at Balcombe, told me of the following episode which took place during Easter. He and his companion had been startled by the incident, but perhaps did not realize the importance of it, though they thought it extraordinary. They were enjoying a camping holiday on a farm near Ravenswood, where rabbits were plentiful. Thinking that they might be able to shoot a fox, they left a dead rabbit in the open and sat and waited to see whether a fox might be attracted to it. To their delight, a fox came along,

and as it approached, they prepared to fire. Suddenly, to the surprise of the sportsmen, the fox was plucked from the ground by a Wedge-tailed Eagle, and before they could recover their composure, it carried the fox from their sight around a hill. Mr. Griggs said it happened so quickly that the fox was theirs one second and the eagle's the next. This incident seems to have more than ordinary significance and to be well worth placing on record.

—C. F. LEWIS.

WHAT, WHERE, AND WHEN

F.N.C.V. Excursions:

Saturday, October 19—Woodend to Macedon. Take the 9.30 a.m. express from Spencer Street to Woodend. Bring two meals. Return train arrives Melbourne 7.12 p.m.

Saturday, October 26—Pilgrimage to Baron von Mueller's grave at St. Kilda Cemetery for the centenary of Mueller's appointment as Director of the Botanic Gardens. Pastor Steineger will conduct a choir which will sing two German folk songs, and a short address will be given by Mr. J. H. Willis. Meet at 3 p.m. at the main gate to the cemetery. Members are particularly requested to attend.

Tuesday, November 5 (Cup Day)—Club picnic to Strath Creek. Leader: Mr. J. R. Garnet. Parlour-coach leaves Batman Avenue at 9 a.m. Bring two meals. Fare 17/-. Bookings with Excursion Secretary.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated.)

Wednesday, October 16—Microscopical Group.

Friday, October 18—Botany Group. The Group will meet in Mr. Lord's room at 514 Little Collins Street at 8 p.m. (between King and William Streets).

Monday, November 4—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms at Parliament House at 8 p.m. Enter through private gate at south end of Parliament House.

Wednesday, November 6—Geology Group. Literature Night. Speaker: Mr. E. D. Gill.

Preliminary Notices:

November 16-17—Bendigo F.N.C. visit to Melbourne. Details on page 75.

Thursday, December 26-Wednesday, January 1—Parlour-coach excursion to Gippsland district. Details in last month's *Naturalist*.

MARIE ALLENDER, Excursion Secretary

19 Hawthorn Avenue, Caulfield, S.E.7

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PROCEEDINGS

The President, Mr. J. Ros Garnet, chaired the General Meeting held at the National Herbarium on October 14 last. He referred with feeling to the loss the Club sustained by the death of Mr. J. J. Freame who had been a member of the Club for many years. Mr. Swaby reported the death of the father of one of our Junior Members, Mr. Maurice Wilson. The sympathies of the Club were extended to Mrs. J. J. Freame and to Mr. Maurice Wilson.

The subject for the evening was "Recent Discoveries of Fossils at Strathdownie, Western Victoria". Fossils of various extinct animals, together with colour slides of the localities in which they were found, provided a very interesting and educational talk. The President extended the thanks and appreciation of the Club to Mr. Gill for his address.

A letter received by the Club from the W.A. Field Naturalists Club advised that the Natural History Medallion had been awarded to Dr. Serventy at the wildflower display held in Perth during September.

Both Mr. Garner and Miss Lester commented on the Club's nature show held at Prahran last month. Mr. Garnet said he was disappointed with the attendance by members of this Club at this show. Miss Lester suggested that members should be given at least eighteen months in which to prepare for a major show so that members from within each group would be able to participate in it.* A letter of appreciation has been written to Mr. Ian Wallace to thank him for the great help he gave in transporting equipment for the show. Another letter of thanks has been sent to Mrs. Freame thanking her for allowing the Club to use some of her material, although Mr. Freame was very ill at the time.

Mr. D. J. Dickison was elected to Honorary Membership; Mrs. S. L. Ovenden (East Melbourne), Miss C. G. Vollbehr (South Yarra), and Mr. W. G. Years (Highett) were elected as Ordinary Members; Mr. A. M. Bald (Harrow), and Mr. R. F. Burn (Geelong West) as Country Members.

Mr. Wakefield reported seeing a Bell Miner at Noble Park. He also referred to the consistent germination of mistletoe seeds deposited on branches of various shrubs in his garden. Mr. Swaby

* It is hoped that the constructive criticisms embodied in Miss Lester's talk given at the last meeting will be presented in the next issue of the *Victorian Naturalist*, together with a careful analysis of all aspects of the show. Any member who cares to submit any such criticisms on this show may do so if he wishes.—Ed.

suggested that members attempt to germinate these seeds which had not been through the alimentary canal of birds.

Among the exhibits shown at the meeting were two epiphytic orchids—*Dendrobium striolatum* from East Gippsland and *D. gracillimum* from New South Wales—which had been in cultivation for many years (Mr. Garnet); two species of *Murex* from Corinella (Mr. P. Fisch); algal limestones in process of formation from Biscuit Flat, 20 miles from Robe, South Australia (Mr. K. Hately); *Citrus* Gall Wasp (Mr. F. Curtis); *Haliotis* or Ear Shell and Pheasant Shells from Rottnest Island, West Australia (Mrs. F. Lewis); ten native flowers and one introduced (Mr. A. Webb).

MICROSCOPICAL GROUP REPORT

The subject for the evening of October 16 last was "Fluid Mounts". Mr. Snell opened the discussion by quoting from literature written by leading international authorities on the subject and mentioned the various techniques employed in making such mounts. After the discussion, Mr. Snell demonstrated his 54-inch home-made micro-projector by a number of slides until the meeting closed.

HAWTHORN JUNIOR FIELD NATURALISTS CLUB

A report on the activities of this club, together with a list of their monthly meetings dating back to 1943, has been received from Mrs. Freame.

On 30th August last, this active club held its fourteenth anniversary party at which some thirty members and friends attended.

This club has purchased a lantern and has now got a small bank account. Mrs. Freame, their Secretary, states that she could not have carried on over the years without the valuable support of Mrs. Carbines, and Messrs. Baker and Fisch. Mrs. Freame appeals for greater interest from the F.N.C.V.

BALLARAT FIELD NATURALISTS CLUB

We have received the annual report from this club. It has 12 financial members. The office-bearers are: President, Mr. A. Sonsee; Treasurer, Mr. E. Cummins; Secretary, Mr. J. R. Wheeler (42 Bradshaw Street, Ballarat).

NATIVE PLANTS PRESERVATION SOCIETY

The club has received the 1957 annual report of this Society, and, as usual, this shows a long list of projects undertaken and successes achieved—but also records that expenditure has substantially exceeded income.

The report makes two encouraging points: that if soil is undisturbed it is almost unknown for introduced vegetation to make headway against native growth; and that native plants can "make a come-back" when protection is afforded, even although they have disappeared for many years.

THE AUSTRALIAN ABORIGINES AND FOSSILS

By EDMUND D. GILL*

Flint is a crypto-crystalline form of quartz, found commonly in warm shallow seas with a calcareous floor almost free of terrigenous sediment. One of the latest discussions of the formation of these nodules is that of Rutten (1957). The limey environment may be connected with the fact that silica is more soluble in alkaline than acid waters (Mason 1952). The source of the silica is probably the skeletons of siliceous organisms, such as siliceous sponges. The flints found in the Cretaceous chalk of England are famous, and in Australia the flints formed in the Lower Tertiary limestones that outcrop in the vicinity of the Victorian-South Australian border are notable. From the latter, large palaeolithic-looking axes were made by the aborigines. The artefacts are so distinctive that McCarthy (1938) applied the culture name of *Gambierian* to them. At Holloway's beach, just east of the border (see Geological Survey of Victoria map), there is an extensive emerged shore platform with numerous pebbles of flint eroded from the Tertiary beds (Plate 7). On the landward side of the beach are two sand ridges, and on the hard ground bared by a windblow in the more landward of the two ridges, the writer found two of these tools.

Unfortunately, no flint tool of this type has yet been found *in situ* by a person able to estimate the age of the deposit containing it. The "culture" is thus undated. Tindale (1957) has doubted whether these implements should be regarded as belonging to a specific culture.

FOSSILIFEROUS FLINT IMPLEMENTS

The flints referred to in the preceding paragraph occur in enormous numbers along the coast. Plate 7, Fig. 2, shows how they occur on the Pleistocene emerged shore platform at Holloway's Beach west of Nelson. They have also been observed in Pleistocene rocks in the caves of the same district. The aborigines could therefore readily obtain these flints from a number of sites along the coast and from exposures in caves and sink-holes. The natives apparently carried these flints considerable distances, and perhaps traded them from tribe to tribe.

1. THE TALINDERT IMPLEMENT. Casey (1936) described an aboriginal knife of "brown or honey-coloured fossiliferous flint", which was discovered when a drain was being dug on the polo ground at "Talindert", south east of Camperdown, Western Victoria. The site is on the ash spread of the Mt. Leura caldera (Gill 1953), which is of the order of 10,000 years old (Gill 1955) since a lacustrine stratum not far below gave a radiocarbon age of

* Curator of Fossils, National Museum of Victoria.

PLATE VII



FIG. 1. Holloway's Beach, on coast between Glenelg River, Victoria, and South Australian border. Quarternary emerged marine terrace.

FIG. 2. Early Tertiary flint nodules as they occur at Holloway's Beach. These were used by the aborigines for the manufacture of artifacts, which were carried to sites hundreds of miles away.

approximately 13,700 years. The site has been examined, but there is no evidence available of the relationship of the implement to the tuff. It can only be stated that the knife is as old or younger than the latest of the tuff layers.

Casey (p. 92) says: "No other example of a blade implement as large as this has been found in Victoria." Another anthropologist found reason to doubt the original provenance of this specimen because it was the only one recorded in this State at the time, and because the blade is so much like a woman's knife as used among aborigines in Central Australia. The question was therefore put to the author whether this knife might in fact have come from Central Australia.

Examination showed the presence of Tertiary foraminifera, and so the specimen was submitted to Mr. Alan Carter, who recognized a foraminifer diagnostic of the Lower Tertiary. No Tertiary marine rocks are known from Central Australia, but, as already mentioned, nodules of flint are common in the Lower Tertiary marine rocks of the Nelson District. It is therefore probable that the blade was made of this material. The site is approximately 130 miles from the Victorian-South Australian border.

Mitchell (1949, Fig. 39, p. 41) has since recorded a similar implement from Inverleigh, Victoria.

2. IMPLEMENTS FROM LORQUON.—In 1955, Pastor Les. C. Miles of Lorquin, south-west of Lake Hindmarsh in northern Victoria, sent to the writer a number of flint implements which he collected locally. No flint occurs naturally in that area, the country consisting of Quaternary deposits which are the latest in a long series of Cainozoic deposits infilling the ancient Murray Gulf. Mr. A. Massola, Curator of Anthropology, National Museum of Victoria, described the implements as a series of discoidal scrapers, one of which may have been used as an adze stone. The flint is fossiliferous, including foraminifera and bryozoa, but most of the fossils are generically unidentifiable. The pieces of flint are light grey, fawn, brown, and reddish brown in colour. Lithologically and palaeontologically, it is likely that these flints also came from the Nelson district. Lorquin is over 160 miles from Nelson.

FOSSIL IN ABORIGINAL CACHE

The late Mrs. Fenton Woodburn of Black Rock, Victoria, collected many fossils and other objects of natural history interest in Central Australia during the later years of her life. She informed me that she found secreted in a cave what appeared to be a piece of grasstree gum, but some who have examined it think it may be bat guano preserved in a particular manner because of the dry conditions. However, with it was a specimen of the well-known fossil *Thalassina anomala*.

In his review of the Quaternary beds of the Northern Territory, Dr. R. W. Fairbridge (1954) refers to the presence of these fossils in the mangrove muds: "A rather common fossil in these emerged mangrove muds, found all the way from the West Australian border to Queensland, is the crustacean *Thalassina anomala*." It would appear that the specimen in question was traded by aborigines from the north coast of Australia down to aborigines in the Centre, for whom it would no doubt have considerable teratological significance. It may have been a magical object, and as such was kept hidden except for the special occasions on which it was used.

ABORIGINAL AS A COLLECTOR OF FOSSILS

Dr. F. W. Whitehouse (1948) wrote an article with this title in which he recorded an artefact made from a piece of flinty chert so as to retain a complete specimen of a Cambrian trilobite. Among the implements collected from the Nangram Lagoon (where the aborigines gathered each season to feast on the seeds of the large red water-lily) were two pieces of fossiliferous rock:

1. "A fragment containing a portion of a *Spirifer* and some crinoid ossicles." These were noted to be Permian fossils of which the nearest known outcrop is at Cracow, 130 miles distant.
2. An ammonite (*Myloceras*) and a bivalve (*Aucellina*) of Lower Cretaceous age, the nearest known outcrop of which is some 280 miles to the north-west.

The only satisfactory explanation seems to be that the aborigines carried these fossils from distant parts to the Nangram Lagoon. Dr. Whitehouse also records an Ordovician cephalopod, *Calibounerus*, shaped somewhat like a cylon, which an aboriginal brought to him. It was picked up on rocks of Cambrian age from which it could not possibly have been derived.

FOSSIL WOOD FROM A MIRRNYONG

In the palaeontological collection of the National Museum of Victoria, is a segment of the silicified trunk of a tree. The specimen measures 6 in. by 3 in. by 2 in., is fully silicified, and stained brown by iron oxide. It was found by Miss A. Bray on a "blackfellows' oven" at Piangil. The more regular surface of the fossilized wood is polished, which may be due to much handling by the aborigines, or to some natural process such as wind polishing. Presumably, it was collected by the aborigines, and may have been intended for artefacts, or perhaps was selected for some magical reason. In some areas of Australia, including the midlands of Tasmania, silicified wood was used by the natives for implements (see Mitchell, 1949, p. 92).

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MISCELLANEOUS NOTES ON LAND MOLLUSCA

By RON. C. KERSTAW*

Notes on the mating habits of *Limax gagates* Draparnaud, *Helicarion cuvieri* Ferussac, and *Cystopelta petterdi* Tate are included with a discussion of the habitat of *Cystopelta petterdi* and *Pasmaditta jingerringanniae* Petterd. These observations have been made in the vicinity of the west arm of the Tamar River, north Tasmania.

LIMAX GAGATES Draparnaud.

The introduced black slug is altogether too common throughout Tasmania. It is variable in size and colour so far as one has observed to the present. A pair of slugs was observed in the early morning, mating on the flat exposed surface of a piece of bark. The slugs, having approached within a few inches of each other, began circling so that each followed in the other's tracks. This circling was persisted with for some time, at least five minutes, until the mucous trail was of some thickness. At a moment when the slugs were at opposite points of the perimeter they both turned toward the centre and moved together whereupon mating took place. Some time later they were observed lying about an inch apart, but eventually the apparent condition of torpor was thrown off and both vanished from sight.

HELICARION CUVIERI Ferussac.

This species has been observed on numerous occasions in various stages of mating, as it is especially common on the Tamar. Almost invariably the larger individual pursues the smaller when there is difference in size in the individuals concerned. The course followed is very erratic, apparently having no rhyme or reason. The pursuer

* Honorary Associate in Malacology, Queen Victoria Museum, Launceston.

is frequently able to catch up, particularly if there is much difference in size, and on such occasions there is considerable interest manifest in the mucous gland of the pursued animal. The pursued then will increase speed to move away temporarily. After an indefinite period the erratic chase ceases and mating takes place. As to how long the process lasts one cannot say as there has always been insufficient time available to ascertain this point.

CYSTOPELTA PETTERDI Tate.

During a period of considerably increased rainfall, the native slugs became very plentiful in all sorts of situations. Two individuals were observed climbing a tree to a point approximately five feet from the ground. Without any preliminary courtship, at least to this point, mating took place. *Cystopelta petterdi* responds very noticeably to variation in rainfall. In periods of prolonged low rainfall it becomes very rare and difficult to find even in more or less marshy situations. With an increase in rainfall, however, numbers of individuals begin to appear within a relatively short period, and if the rainfall is persistent and prolonged over many months slugs may appear in places normally too dry for them. These adventurous ones are probably unable to find suitable places to enable survival as the warm weather approaches, and soil moisture lowers. In low rainfall areas the species cannot be said to be normally common or gregarious, and usually not more than one individual is seen at a time except when mating. However, during considerable increases in rainfall mentioned above, they become very common.

Cystopelta petterdi may be considered reasonably susceptible to dryness, due to its lack of a shell. Hence an attempt was made to ascertain how much "dryness" it could withstand in order to obtain a guide to its requirements for survival. *C. petterdi* does survive under a wide range of natural conditions, as it is found in wet forests, in tea-tree swamps, and in normal sclerophyll forests, and even when the rainfall is below 25 inches. The slugs observed were collected in dry sclerophyll forest growing on sandy soils a few miles from the mouth of the Tamar River. Individuals placed in a match-box where moisture, but not air, was excluded, shrivelled and dried after three to four hours in several cases, although one survived almost twenty-four hours. Several individuals placed in an airtight tin without moisture were found to have shrivelled and dried within three hours. Incidentally, individuals for these tests were obtained during a period of increased rainfall when they were frequent.

A number of individuals of *Helicorion cuvieri* were collected for testing for comparative purposes. Those placed in a match-box remained alive for seven days after which they rapidly began to shrivel. But in an airtight tin they survived for less than three days. The greater survival ability of this species may be correlated with

the fact that in nature its activity continues under much drier conditions and over longer periods than any other native mollusc.

In the West Tamar area prior to 1953 a very much below average rainfall brought virtual drought conditions for many months at a time. *Cystopelta peltieri* survived these conditions, and, as noted above, responded readily to the subsequent increase in rainfall. During the summer months, a careful search was made with a view to ascertaining conditions which would enable survival. It was found under rotting logs and bark in marshy areas, but this was not considered as a useful guide in dry areas where *Cystopelta* was very definitely absent from such places. It became obvious that only positions where the presence of moisture was possible were likely to yield results, and, furthermore, it would have to be a position where moisture could be relied on for several months at a time at least. There would have to be adequate shelter from the sun, and drainage conditions would have to be favourable.

Eventually a live individual was found in a position which met these requirements sufficiently to ensure survival at least during the summer months. This position was a shallow depression in which masses of leaves formed a mulch. There was a high proportion of shade present from trees and shrubs throughout the day, which, coupled with slope and the nature of the sub-surface drainage, would ensure moisture for a long period. The slug was found curled up on the moist soil beneath the leaves, and appeared to be in a torpid condition, suggesting a state of aestivation. Leaves on the surrounding surface outside the depression lay on dry soil. Although a search was made of numerous apparently favourable positions only few individuals were found despite the abundance of them a few months earlier.

Survival, then, seems to depend on the mollusc being in appropriate surroundings at the onset of dry weather, but how appropriate these surroundings were would depend on their efficiency as moisture traps, and in the long run the period during which rain was absent would tend to be the deciding factor. Many *Cystopelta* must die every year through lack of moisture in areas with a dry summer climate; however, under the normal climatic cycle, a breeding stock apparently survives through even prolonged dryness. The possibility that eggs may survive long periods of drought may be another factor but no information has been obtained in relation to *Cystopelta*. It is of interest to note that after prolonged dry periods, the first rains brought out literally thousands of juveniles of the introduced snail *Helicella caperta* Montagu, but fortunately a large proportion did not survive for long and a feared plague in the garden did not eventuate.

Shelled molluscs undoubtedly possess a decided advantage in being capable of retaining sufficient moisture within the shell for prolonged aestivation. *Helicorium cuvieri*, which cannot withdraw

into its shell entirely, is faced with a problem similar to that facing *Cystopeltis*, though it is somewhat modified. *Helicarion*, as has been noted, is able to survive greater conditions of dryness than other native species. Is this only due to the presence of the shell? By comparison with other shelled molluscs this hardly seems likely, although it is not surprising that a shell, however inadequate, would be of some value. There is evidently some other factor involved.

PASMADITTA JUNGERMANNIAE Petterd.

A colony of this paralaomid species was found in a rotting log situated in a shaded position in dense bush, and a lengthy search in this area revealed only one other colony about a half a mile away. Inside the log these tiny molluscs were active at all times of the year, and with prolonged wet conditions some individuals were found moving about under leaves several feet from the log. In the Cataract Gorge at Launceston, thirty miles south of the above site, W. F. Petterd found this species in numbers crawling on moss-covered stones. Rainfall and rainfall reliability are somewhat higher at Launceston than at the mouth of the Tamar, and this may account for the greater exposure tolerated as suggested by this example. This species would seem normally to be gregarious and to live in apparently somewhat isolated colonies. Examination of a number of individuals suggests that the species is homogeneous. How did the colony under notice reach their particular log? A search of dozens of logs failed to reveal any more than those mentioned above.

It may be noted that only well-rotted logs are inhabited by molluscs. During prolonged wet weather some individuals do venture forth and these may perhaps furnish a link in the finding of a new home when the old one is eventually destroyed. Thus, one may imagine that these adventurers may find another suitable log in time and establish a new colony while the old one dies with its habitat, or falls victim to birds scratching in the final debris. The colony mentioned would appear to be a survival from days before the land in the area was cleared for purposes of cultivation, a matter of forty years. It is not necessarily implied that this present log housed them then, but it seems unlikely that there have been many available in the small area in which they were found. In addition, it seems unlikely that they may survive much longer as there is a dearth of logs in a suitable state of decomposition, but it may not be entirely out of the question as in this sheltered place there is always a quantity of debris in which molluscs may shelter, provided suitable food is available. Drought, fire, isolation, and the activities of man are becoming mighty forces in reducing the chances of survival of these tiny creatures in many places where once they were perhaps secure.

NEW RECORDS OF MOSES FOR AUSTRALIAN STATES
(Victoria, Tasmania and the Northern Territory)

By J. H. WILLIS*

Victoria

ANDREAEA NITIDA Hook. f. & Wils., 1844: S.E. portion of Mt. Buffalo plateau—moist shaded granite rock surfaces at Dickson Falls, about 5,000 ft. (K. W. Atkins, No. 221 W., Dec. 1952); Mt. Buller—shaded surfaces of columnar basalt along S. escarpment of "Baldy", growing with *Lepidozodon lagurus*, etc., at about 5,400 ft. (J. H. Willis; Mar. 1953).

A robust and usually glossy species of limited distribution in Tasmania, New Zealand and Auckland Islands. No previous collections have been recorded from the Australian mainland, but the species should be sought also in the Mt. Bogong (Vic.) and Kosciusko (N.S.W.) alpine regions. Its quite obtuse, broadly elliptic to almost orbicular leaves have short indistinct nerves (vanishing about half-way along the leaf); they differ manifestly from those of all other Australasian species, except the Andean and Fuegian *A. wilsonii* Hook. f. & Wils. (reported from Campbell and Auckland Islands) which is hallmark by a cylindrical capsule with 4-8 slits.

On April 10, 1954, I collected both *A. repens* Hedw. and *A. subulata* Harvey ex Hook. on granite rocks near the summit of Strzelecki Peak (at about 2,200 ft.), Flinders Island. These connect Victorian and Tasmanian occurrences and are the first records of the genus for Bass Strait.

ANOECTANGIUM ? BELLII Broth. ex Dixon, 1926—forma: Byaduk—“forming beautiful cushions on damp basalt walls of a cave” near Harman’s Creek (*A. C. Beauglehole*, No. 3899, Nov. 1955).

The writer’s tentative determination (No. 278W., 15/2/1956) was confirmed by Mr. G. O. K. Sainsbury (22/2/1956)—as far as identification is possible from barren material. No other species of *Anoectangium* is known to occur in Australia and, hitherto, *A. bellii* had been regarded as an uncommon New Zealand endemic; it is very close to, and may yet prove to be a variant of, the boreal species *A. compactum* Schwgr., American populations of which exhibit somewhat intermediate characters. Barren plants, lacking the lateral setae, are remarkably similar to cushions of *Amphidium cyathicarpum*, and may even grow in close proximity to that species; but the drying leaves of *Anoectangium* are much less crisped (or circinate), while the nerve is almost always roughened and papillose—it is smooth throughout in *Amphidium*. Beauglehole and Learmonth, in an excellent paper “The Byaduk Caves” [Vic. Nat. 73: 207 (Apr. 1957)], record this moss with the comment “a feature on the damp walls of several caves . . . it is the commonest moss in the ‘Flower Pot’, forming masses up to several inches across”.

TORTELLA DAKINI J. H. Willis, 1955: Byaduk—on basalt rocks along road leading to caves, growing with *Ptychomitrium australe* (*A. C. Beauglehole*, No. 3840, Jan. 1956).

The record is repeated here as a tribute to the enthusiasm and assiduity of the collector, Mr. Cliff Beauglehole, who has performed a meritorious service in elucidating the distribution of all mosses (116 species) in far south-western Victoria—Normandy and Follett Counties. As soon as this rare species was described [Vic. Nat. 72: 6 (May 1955)], from the single known collection (Warrandyte), he conducted an exhaustive search in his district and eventually succeeded in tracking down a second occurrence of the plant, on basalt at Byaduk—see habitat note with this record by Beauglehole in Vic. Nat. 73: 208 (Apr. 1957).

* National Herbarium of Victoria.

ALOINA AMBIGUA (Bruch & Schimp.) Lumpr. 1888: Between Lower Glenelg River and McEachern's, in County Follett—growing with *Ceratodon purpureus* and *Tortula muralis* on limestone rocks near pines (A. C. Beaglehole, No. 4020, Sept. 1953).

An apparent introduction new to Victoria, but an occurrence at Marion near Adelaide (S. Aust.) was recorded in *Vic. Nat.* 72: 9 (May 1955). This species differs from the single indigenous *Aloina sullivaniana* (C. Muell.) Broth. principally in its leaves, which lack any hair-points. Rows of simple lamellae densely cover the upper surfaces of the leaves. In "A. J. Grout's *Moss Flora of North America* (1928-40), the plant is treated as a variety of *A. aloides* (Schultz) Kudb.

PHILONOTIS AUSTRALIS (Mitt.) Jaeg., 1875: Between Mt. Beauty and Bogong township—growing with *Bryum blandum* on a damp illuminated wall above roadside of S.E.C. construction area, at about 1,700 ft. (A. C. Kay, S.E.C., Feb. 1956); Green's Creek waterfall on Bogong S.E.C. race, about 3 miles N.E. of Bogong township (A. C. Kay, Oct. 1956).

This constitutes the first record of the species for the Australian mainland: it had previously been noted only in New Zealand, Kerguelen Island and Tasmania—a doubtful specimen from St. Mary's Pass [see G. O. K. Sainsbury in *Papers & Proc. Roy. Soc. Tas.* 89: 19 (1955)]. As pointed out by Mr. Sainsbury (who determined this moss for me, No. 275W., 22/2/56) in his *Handbook of N.Z. Mosses*, 1955, *P. australis* differs from the other two much more common Australian species (*P. tenuis* and *P. scabrifolia*) in its robust habit, preference for very wet habitats and longer (2 mm. or more), plane-margined leaves which are lanceolate-secund as in *Hypnum*. The two Victorian collections are unfortunately barren.

PSEUDOSCLEROPODIUM PURUM (Hedw.) Fleisch., 1915: West Portland—forming large patches over ground, sometimes with *Hypnum cypresiforme*, on fringe of the town reserve (A. C. Beaglehole, No. 4025, Sept. 1956).

Widespread in the northern hemisphere, also in Argentina, this robust member of the *Brachytheciaceae* is sometimes known as Neat Meadow Feather Moss. The major branches, to 6 inches long, are regularly pinnate with blunt-ended branchlets, the whole appearing swollen and very translucent when wet. Leaves are broadly ovate and closely overlapping, but capsules are rarely produced. The species has not been recorded previously from Australia, and it is almost certainly introduced here—just as in the two known New Zealand occurrences (at Auckland and Tasmania). Throughout Britain it is a frequent, abundant moss in wet grassy places and on shaded banks. [In a recent private communication, Dr. D. J. Carr of the Botany School, Melbourne University, reports occurrences of *Pseudoscleropodium* in both the Macedon and Dandenong Range areas; he intends to discuss these and other probable instances of moss introductions in a forthcoming paper.]

Tasmania

ERIOPUS BROWNII Dixon, 1927: Nutley Fern Gorge near Launceston—on bark and tree-fern trunks in rain-forest of Gordon limestone formation, at about 800 ft. (Mary Tindale, Dec. 1954—"H.ZT" in Nat. Herb. N.S.W.).

The species is new to the Commonwealth and makes the third known representative of its genus in Tasmania [*E. flexicollis* (Mitt.) Jaeg. and *E.*

apiculatus (Hook. f. & Wils.) Mitt. being the other two); it had been considered endemic in New Zealand where it is widely distributed, especially in the North Island, although seldom collected. *E. brevemi* is closely related to *E. apiculatus*, having a stout glabrous seta (only 2.3 mm. long in the Lamerton specimen), the nerve very short and ill-defined or even lacking; but it departs from this and all other austral species in its very narrow, weak leaf-blader. The apiculus is short but slender. Mr. Sainsbury kindly confirmed my determination (No. 273W., 25/9/1955).

Northern Territory

Up to the present time, no more than seven species of mosses have ever been recorded from the vast area (more than half a million square miles) of the Northern Territory. Indeed, until the writer published the occurrence of four additional species [See *Vic. Nat.* 72: 74-75 (Sept. 1955)], the only three known were *Fissidens victorialis* Mitt., *Octoblepharum albidum* Hedw. and *Brachythecium freissnianum* (Hampe) Jaeg.—a single collection of each, represented in the Melbourne Herbarium. It is now possible to add the following eight species, making 15, and there still remain (in my moss herbarium) five recent collections which can not be recognized, except as to genus—two in *Fissidens* and a possible *Trichostomum*, *Bartsia* and *Pohlia*. Unfortunately, all these examples are barren—a very common condition among mosses occurring in the Territory.

Even the present tally of 20 species is astonishingly low. Have all botanical collectors in North and Central Australia during the past century, given but scant or haphazard attention to the bryophyte flora? Perhaps mosses have not always been gathered as assiduously as have the vascular plants; but I do not believe that an affirmative answer would satisfactorily explain the present paucity of recorded species. As long ago as 1814 Robert Brown commented [Appendix III of Flinders' *Voyage to Terra Australis*, p. 539]:

In several of the islands of the Gulf of Carpentaria, having a Flora of Phanerogamous plants exceeding 200 species, I did not observe a single species of moss.

Baum von Mueller, who spent eleven months in the Northern Territory with A. C. Gregory's expedition (1855-56), wrote concerning *Fissidens victorialis* Mitt.—“one of the only three mosses seen by me in North-west Australia in 1855 and 1856.” Later he remarked [Analytical Drawings of Australian Mosses 1: 6 (1864)]: “The whole of tropical Australia with the exception of its eastern wet forest mountains, is almost totally devoid of mosses.” Also R. L. Specht, botanist with the National Geographic Society-Smithsonian Institution Expedition to Arnhem Land (in co-operation with the Australian Government) during April to November 1948, failed to secure a single moss, although he covered great distances and collected 13,500 plant specimens (including a number of lichens and fungi).

For a number of years past, I have had a team of enthusiastic collectors constantly on the look out for mosses and moss-like plants, both in the Territory and in far north-western Australia. To their efforts entirely I am indebted for the records now being published, but they all have the same story to tell—very few species, occurring at comparatively few and isolated places. We are faced with the inevitable conclusion that the Territory is quite unfavourable to bryophytes, supporting only a small number (probably less than 40 species) of mosses, mostly small ephemerals; no plenocarpous kind has yet been found. It is almost certain that intensive observation—especially along watercourses, at springs and in temporarily damp spots—will reveal the presence of certain widely-ranging, minute species, e.g. in the as-yet-unrecorded genera *Aegoloum*, *Ephemervum*, *Gymnostomum* and *Goniomitrium*, but their number would be very limited.

TORTELLA CALYCINA (Schwgr.) Dixon, 1923: Finke River (Rev. H. Kemp, 1882—in Herb. MEL); Palm Valley, Finke gorge area (P. Fisch, May 1954—barren).

A hardy, variable species, widespread in coastal, calcareous and inland regions almost throughout temperate Australia. It is recognizable when in fruit by the long cylindrical perichaetium sheathing the base of the seta, and in all stages by the undulate leaves which have at their bases a bold V-shaped area of long hyaline cells, subtending several rows of golden and papillose juxtacostal cells.

POTTIA WILLISTANA G. O. K. Sainsbury, 1956: Standley Chasm, Macdonnell Ranges, on steep boulder-strewn slope (Rica Erickson, July 1955—TYPE in Herb. Sainsb., No. 18, 280; dupl. TYPE in Herb. MEL).

The author of this recently-described moss has remarked [Rev. Bryol. & Lichenol. 25: 4; 237 (1956)] that "its interest is in inverse ratio to its size". The height of the entire plant (slender seta and capsule included) is only 2 mm. !—so that much credit is due to the enthusiasm and acute vision of the lady collector. No other member of the genus *Pottia* has ever been collected in the Northern Territory, and the locally endemic *P. willistana* makes a third known species of the subgenus *Schisophaseum*.

DESMATODON CONVOLUTUS (Brid.) Grout, 1939: Blatherskite Hill, 2 miles S. of Alice Springs (M. Kathleen Woodburn, Aug. 1952—barren); Standley Chasm, Macdonnell Ranges, in damp shaded rock-crevice among ferns and lichens (N. Forde, C.S. & I.R.O., No. 869, July 1957—in fruit).

A hardy, variable, cosmopolitan, and also very widespread species in the drier parts of the Commonwealth (Upper Murchison River, Nullarbor Plain, Musgrave Ranges, etc.). The broadish leaves with revolute margins, obscure papillose cells and granular nerve, which widens prominently toward its slender excurrent point, are characteristic features even when fruit is not available.

FUNARIA HYGROMETRICA Hedw., 1801: Finke River (Rev. H. Kemp, 1882 in Herb. MEL); Palm Valley, Finke gorge area (P. Fisch, May 1954—barren), west of Alice Springs township (M. Kathleen Woodburn, July 1952—barren).

Cosmopolitan and very characteristic with its long setae, oblique arcuate sulcate capsule and double peristome.

FUNARIA APOPHYSATA (Tayl.) Broth., 1903: Standley Chasm, Macdonnell Ranges (G. W. Coombe, June 1955); Hugh River Gap, 40 miles S.W. of Alice Springs, damp shaded ground under *Eucalyptus camaldulensis* (N. Forde, C.S. & I.R.O., No. 873, Aug. 1957).

Often abundant in arid parts of Australia, the erect capsules each having a conspicuous tapering neck (at least as long as the fertile portion) and lacking any annulus or peristome: the collections cited were in fruit.

FUNARIA ? GLABRA Tayl., 1846: Mt. Olga, at permanent water-hole, growing with *Riccia* sp. under *Eucalyptus camaldulensis* and *E. terminalis* (N. Forde, C.S. & I.R.O., No. 156, June 1956).

This single collection was from the steep bank of a large creek, where it formed dense green mats. Fruits are embryonic and useless for purposes of identification; but the toothed leaves, with nerve failing well below the apex, conform well to the circumscription of *F. glabra*—another common, hardy moss.

BRYUM ARGENTEUM Hedw., 1801: Between Macdonnell & Chewings Ranges, west of Alice Springs (M. Kathleen Woodburn, June and July 1952); Blatherskite Hill, 2 miles S. of Alice Springs (M. Kathleen Woodburn, Aug. 1952); Ayer's Rock (M. Kathleen Woodburn, Sept. 1955)—all collections barren

A common and cosmopolitan plant occurring in a reduced and barren condition over much of Central Australia; the obtuse and silvery shoots are unmistakable.

BRYUM ? PACHYTHECA C. Muell. 1849. Between Macdonnell & Chewings Ranges, west of Alice Springs (M. Kathleen Woodburn, June and July 1952); Blatherskite Hill, 2 miles S. of Alice Springs (M. Kathleen Woodburn, Aug. 1952); Standley Chasm, Macdonnell Ranges (P. Fisch, May 1954; G. W. Coombe, June 1955); Talli Patta Springs, about 35 miles W. of Haast's Bluff (P. Fisch, May 1954); Mt. Conner—at the eastern foot (M. Kathleen Woodburn, Aug. 1952); Ayer's Rock (M. Kathleen Woodburn, Sept. 1955); Mt. Olga (A. Binbury, Sept. 1953)—all collections barren.

Very hardy and variable (with a large synonymy) and probably the commonest moss throughout the Territory, but rarely seen in fruit. Its dark red capsules with very obtuse, rugose and swollen bases have been aptly likened to "an acorn in its cup".

Note: Collection numbers suffixed by the letter "W" signify specimens in the writer's own herbarium. The words "fruit" and "capsule" are used instead of the strictly correct *theca* (or *sporocarp*).

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

SALMON-TROUT, WHITEBAIT, GULLS AND FISHERMEN

Further to Mr. Hanks' note in the August issue of the *Victorian Naturalist* (1957), similar drives of Whitebait by Salmon-trout used to occur at intervals of a few years in Lonsdale Bight, between Point Lonsdale and Queenscliff.

I have not heard of them for some years, but this may be due to the fact that I am not such a constant visitor now as formerly. These drives followed a regular sequence—"boiling" of the sea as described by Mr. Hanks, Whitebait rushing ashore to escape, and big Salmon-trout, mad with excitement, dashing backwards and forwards behind them taking any bait offered. Over all, the gulls hovered, but I do not recall these being so thick as to suggest that "foreign" birds were in attendance. At the Heads we always have plenty of our own.

On one occasion, I found a shoal of young Barracouta, about eight inches long, driven up the beach in apparently the same manner. This drive took place in the early morning, when no one was on the beach, so I cannot say whether the enemy was Salmon-trout again, or perhaps the parents of the fish concerned.

Incidentally the "Whitebait" referred to in this note, and presumably by Mr. Hanks, is not the New Zealand species, but a much larger fish, one of a number of similar species closely resembling, both in size and appearance, the fish canned by the Norwegians under the name of *Sild*.

—E. H. COOTZI.

WHAT, WHERE, AND WHEN**F.N.C.V. Excursions and Meetings:**

Saturday, November 16—Combined visit to the Altona Salt Works with the Bendigo F.N.C. Subject: Seagulls and waders. Leader: Miss I. Watson (Secretary of the B.O.C. Altona Survey Group): Transport will be by private cars. Meet at 1.30 p.m. at the loading ramp opposite the C.T.A. Building, west from Elizabeth Street, in Flinders Street.

Saturday, November 16 Combined meeting and conversazione at the National Herbarium at 8 p.m. with the Bendigo F.N.C. Speaker: Dr. M. Chataway (Division of Forest Products, C.S.I.R.O.). Subject: Those Odd Eucalypts. Members are requested to bring a small plate for the supper which will follow the lecture.

Sunday, November 17—Combined parlour-coach excursion to Yellingbo and the Sir Colin McKenzie Sanctuary, Healesville, with the Bendigo F.N.C. Leader: Mr. F. S. Hanks (President of the R.A.O.U.). Subject: The Helmeted Honeyeater and General. The parlour-coach leaves Flinders Street opposite Ball & Welch at 9 a.m. Bring two meals. Fare, 18/-. Bookings with the Excursion Secretary.

Sunday, December 1—Excursion to Brigadier Officer's plantation at Olinda. Take 8.55 a.m. train from Flinders Street to Upper Ferntree Gully and then bus to Olinda. Bring one meal.

Sunday, December 8—Geology Group excursion to brown coal deposits, Bacchus Marsh. Travel details at Geology Group Meeting.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated.)

Wednesday, November 20—Microscopical Group.

Monday, December 2—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms at Parliament House at 8 p.m. Enter through private gate at south end of Parliament House.

Wednesday, December 4—Geology Group. Speaker: Mr. Baker. Subject: Plants of Coal Deposits.

NOTE: The Botany Group will not meet this month because of the Bendigo F.N.C. visit.

Preliminary Notice:

Thursday, December 26—Wednesday, January 1—Parlour-coach excursion to Genoa district. The coach will leave Flinders Street, opposite the Gas Company, at 7.30 sharp. Bring two meals. Members are requested to pay the remainder of the bus fare before, or at, the December meeting. Other details of this excursion have been given in the *Victorian Naturalist* for September.

MARIE ALLENDER, Excursion Secretary

19 Hawthorn Avenue, Caulfield, S.E.7.

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PROCEEDINGS

About 100 members and friends attended the monthly General Meeting at the National Herbarium on November 11, 1957. Mr. J. Ros Garnet, who chaired the meeting, announced the death of Mrs. Pauton, who was the wife of Dr. Pauton. Dr. Pauton has been a member of this Club for many years. A welcome was extended to Mr. and Mrs. Starkey, of Denmark, Western Australia.

Mr. R. F. Burn, of Geelong West, gave a very interesting lecture on Victorian sea-slugs. A brief résumé on this lecture has been supplied by Mr. Burn. He pointed out that because of the lack of enthusiasm by many of the older Australian conchologists, this group had been neglected in Victoria until recent years. About thirty-six species have now been recorded for the State, but there are more which are known to occur and not recorded. A new species was described during the lecture and this is defined on page 116 of this issue. Mr. Burn made general remarks on collection, identification, and preservation. He discussed anatomical details which differ quite markedly from species to species and genus to genus. Species of the five groups of sea-slugs (*Opisthobranchia*) represented in Victoria were described and illustrated. Shells from certain species were exhibited and colour slides of a number of different types were shown to give some idea of the diversity of Victorian sea-slugs. Several interesting questions asked during the evening were ably answered by Mr. Burn.

A report was made of the pilgrimage to Baron von Mueller's grave at St. Kilda Cemetery on October 26 last.

It was announced that Council had given consideration to the views propounded by Miss Lester concerning shows at the last General Meeting, and these have now been referred to the special Show Sub-committee. A request from the Moomba Nature Show Committee asking for volunteers to help set up, care for, and dismantle exhibits for the show during March next year was brought before the notice of members.

The Secretary announced that he had received a letter from the Federation of Tasmanian Field Naturalists Clubs advising that a camp would be held at Cradle Mountain in the near future.

Mr. T. F. Zirkler (Oakleigh) was elected as an Ordinary Member of the Club; Mrs. T. F. Zirkler as Joint Ordinary Member; Mr. C. A. Garreau (Deal Island) as Country Member; and Peter

Killin (Prahran), Ian Disney (Prahran), and Michael Nixon (Windsor) were elected as Junior Members.

Among the nature notes for the evening were reports from Miss Woppard and Mr. McInnes. The former commented on a magnificent display of *Baeckea ramosissima* and *Grevillea repens* at Toolangi. Mr. McInnes said he had seen about 500 black swans at Curdies River. The Secretary, Mr. Coghill, asked if members could tell him the meaning of the name "Boobialla".

The Large Dodder, *Cuscuta europaea*, growing on herbaceous plants and grass on the basalt plains near North Essendon, and collected on October 27 last, was exhibited by Mr. Garnet. He also exhibited garden grown native shrubs. Marine shells, viz. *Humphreyia strangei* and *Dacosta multangularis* from Western Port, *D. australis* from New South Wales, and *Gastrochaena tasmanica* from Port Phillip were also shown. The remaining exhibits were garden-grown native shrubs exhibited by Mr. Haase and Mrs. Fisch; *Nidus* of a Sand Snail by Mr. Hanks; Mount Gambier coralline limestone by Mr. McInnes; and fungi by Mrs. Bailey.

The meeting closed at 10.10 p.m.

FRANKSTON FIELD NATURALISTS CLUB

The Honorary Secretary of the above Club, Mrs. Eleanor Wood, has sent the F.N.C.V. a list of its activities for the next twelve months. A cordial invitation has been issued to members of our Club to attend the meetings and excursions. In 1958, monthly meetings will be held on the fourth Wednesday and excursions to Mr. Mitchell's "Arcoona" Museum, Gres Creek, Beaumaris, Frankston Quarries, "Tubba Rubba", and to Mount Martha and Dromana will also be held.

CONSERVATION AND MANAGEMENT OF WILDLIFE

By A. DUNRAVIN BUTCHER, M.Sc.*

[Summary of Address read before the F.N.C.V. on September 9, 1957]

The rôle of the Fisheries and Game Department is primarily one of conservation and management of wildlife resources but these are not two unrelated activities because sound management is a conservation tool.

Examples of conservation activities readily come to mind. One of the most successful programmes is that of the conservation of the Koala, the population of which has been built up from an estimated 1,000 animals in 1937, to a figure in excess of 50,000 today. These figures refer, of course, to Victoria. Another example is the recent proclamation adding the Australian Pelican, Crimson Rosella, Eastern Rosella, Zebra or Chestnut cared Finch, and Red browed Finch (Waxbill) to the fully protected list. When the original Game Acts were being prepared the Pelican was not pro-

* Director of Fisheries and Game, Victoria.

tected presumably because of its fish-eating habits. The Fisheries and Game Department feels that the Pelican does not present any real threat to fisheries and deserves complete protection. It is not sufficiently numerous to be a major factor in fish destruction. The Crimson and the Eastern Rosella deserve protection all the year round for the interest, colour, and the beauty they bring to the countryside. It is realized that these birds can become a problem in orchards at times, but the position will be met by the Department taking a lenient view on the question of issuing permits for control where it is proved the birds are causing economic damage. Previously, the Zebra or Chestnut-eared Finch and Red-browed Finch (Waxbill) were both protected over the breeding season, but could be taken during the rest of the year. The Fisheries and Game Department feels that aviary stock for these two finches should have become well established, and that these birds should now have complete protection in the native state.

The current licensed, but *not open*, possum season is an example of management. Here is a case of an animal population breeding up to such a level that serious economic damage is being caused. Various red gums, on which a former group recently placed a value of £100 each as shade-trees, are being destroyed. Serious damage is being done to pine plantations (other native animals are also involved here), and damage also is being done to stored grain, fruit, vegetables, and property. The licensed season is aimed at reducing the possum population.

There is a growing realization that regulations *alone* are a negative approach to conservation and management, and in the absence of protection of living space (habitat) will serve little purpose. For example, the greatest need of waterfowl today is adequate and suitable living space. The habitat problem may be approached in three ways: preservation, management, and manipulation.

Colour-slides taken during a visit to the United States in 1954-5 were used to illustrate the habitat problem. Several series of slides were shown.

The first series illustrated the Mattamuskeet Wildlife Refuge in North Carolina. This is a great waterfowl refuge which, to fulfil its rôle in a country with diminishing swamp and marsh land, must be so managed and manipulated that it can carry more waterfowl than it would have carried naturally. This is being achieved by forest management, planting of food crops, and encouraging the growth of submerged aquatic plants to keep the water clear. The latter is achieved by the reduction of wave action and by the removal of carp which keep the silt continuously disturbed when they feed on the bottom of the lake.

The Wichita Wildlife Refuge in Oklahoma was illustrated by the second series. Here a great tract of prairie has been fenced off and an area ideally suited to buffalo is being maintained by sound

soil and water conservation. The buffalo nearly disappeared because of loss of its living space.

Another wildlife refuge, that of Piedmont in Georgia was, illustrated by the third series of slides. This was established as a turkey management area and conservation has been achieved by forest management which gives an "edge effect". This was done by making clearings which increase the actual length of the forest margin or "edge", and it is under these conditions that the turkey breeds best. Food-crops are planted in the clearings.

The fourth series showed fish farming in Alabama. This consists essentially of water conservation and submerging of barren and unproductive land which is then capable of producing fish crops under proper management. Allied activities constitute an important industry—the raising of worms for bait, growing of bamboo for fishing-poles, and the construction of many thousands of ponds.

The fifth series covered miscellaneous refuges over a large part of the United States and demonstrated that maintenance of habitat is the key to conservation. Perhaps the most striking example was the series of slides showing the Whooping Crane in the Arkansas Wildlife Refuge on the Gulf of Mexico. This great refuge was established in an attempt to save the twenty-odd birds which now remain.

Finally, some groups of slides dealt with the Yellowstone National Park in Wyoming, the Crater Lake, National Park in Southern Oregon, and the Organ Pipe Cactus National Monument in Southern Arizona. The particular significance of these national parks is that tracts of country are being maintained in a natural state. Many national parks are great wildlife refuges.

Reference was made to the rôle of clubs and organizations such as the Field Naturalists Club. We have already entered the era of the professional conservationist and wildlife manager. What is the mutual and relative rôle of the Field Naturalists Club which has been active for very many years and which has pioneered activities in some fields, and the Fisheries and Game Department? Is this not a period during which there will have to be reorientation and adjustments?

PILGRIMAGE TO BARON VON MUELLER'S GRAVE

(Commemorating the centenary of his appointment as Director of Melbourne Botanic Gardens, August 13, 1857)

On the balmy spring afternoon of Saturday, October 26, sixty people gathered at St. Kilda Cemetery to participate in an important celebration which had been arranged by Pastor E. Steiniger (of the German Lutheran Church) in conjunction with the Council of the F.N.C.V. Mr. R. T. M. Pescott, present Director of the

Botanic Gardens, was in charge of the programme at the graveside, and among those welcomed were: the Vice-Consuls for Germany (Doctors Jovy and Hinze); Mr. A. J. Hopton, O.B.E., representing the Historical Society of Victoria; the President of the Field Naturalists Club (Mr. J. Ros Garnet), and many members of Pastor Steiniger's church. Attendance of F.N.C. members was disappointing, and those who could have come missed a solemn but inspirational occasion.

Three addresses on the life and work of von Mueller were given (by Mr. J. H. Willis of the National Herbarium staff, Mr. Hopton and Pastor Steiniger), interspersed with two folk-songs delightfully rendered in harmony by a choir from the German Lutheran Church: under the able baton of Mrs. Ramp—"Wer hat dich, du schönen Wald" (by Eichendorff) and "Ihr wunderschönen Bergeshühn" (Gebhardt). A member of the choir (Mrs. Ilauer) placed a simple fragrant wreath of Black Wattle blossom (*Acacia mollissima*) on the grave. Three small shrubs of Red Boronia (*B. heterophylla*), supplied by the Botanic Gardens, were planted by Messrs. Garnet, Hopton and Pastor Steiniger, under the supervision of Mr. Pescott who explained that this charming West Australian flower was one of the very many named by Baron von Mueller during his long term as Government Botanist. It was gratifying to note the flourishing state of *Borkeea*, *Calytrix* and other bushes planted within the grave-railing on previous pilgrimages. The area outside the railing has now been bricked-in and the two eucalypts (Snow Ginn and Brown Stringy-bark), which were growing there ten years ago, removed. No weeds are present. This impressive, if humble, commemorative function ended with an appropriate recital of the Lord's Prayer in German by the Pastor and his choristers.

Of the three speakers, Mr. Hopton stressed the value of Baron von Mueller's geographical and exploratory work throughout Australia. In some detail he traced the itinerary of that first Victorian journey in autumn 1853 when 1,500 miles were covered during three months in the mountainous triangle between Melbourne, Beechworth and Wilson's Promontory. Before that same year was out, he had penetrated west to the Grampians, through the Mallee to Wentworth, and back along the Murray to its sources in our highest alps (2,500 miles in six months). Spring of 1855 found him in the Northern Territory with Augustus Gregory's famous overland expedition. Thus, during his earlier years in Australia the great botanist made journeys (mostly on foot or by horseback) totalling no less than 27,000 miles, which would be a prodigious distance to any modern explorer using good roads and mechanical transport. He was the first white man to ascend many high peaks, and it is regrettable that the names he bestowed on some of these have since been transposed or superseded altogether. In later years, when field explorations were beyond his declining vigour, Mueller encouraged

and supported younger men in their expeditions to remote places— even the Antarctic and the Highlands of New Guinea.

Pastor Steiniger spoke feelingly of Mueller's deep religious convictions and faithful attendance of his church—a refreshing and unusual attribute in an age when the élite of science were predominantly materialist-minded. Ferdinand Mueller was certain of his God, looking upon time and talent as divine gifts to be used creatively and seeking ever to find how Nature could be made to serve the divers needs of mankind. "They are known by their fruits" was a favourite quotation, and how prophetic of his own enduring worth! The Rev. Herlitz, who conducted Mueller's burial service, was also at one time the spiritual mentor of Pastor Steiniger to whom he would recount how the great botanist invariably came up at the conclusion of church services and offered thanks for a helpful message.

Mr. Willis briefly traced Mueller's impact on the scientific and cultural life of the community, from his arrival in Australia until his death half a century later, mentioning some of the botanist's great achievements without minimizing the strain and difficulty which often lay behind them. This address is reproduced below:

On Sunday, 16th October 1896, there passed away the greatest Australian scientist of the last century—Baron Sir Ferdinand von Mueller, K.C.M.G. and holder of nineteen other knightly honours from almost every reigning monarch in the world, not to mention five university doctorates and membership with some 150 different scientific societies. Three days later his mortal remains were interred at this very spot before such an assemblage of distinguished and erudite people as Melbourne has rarely witnessed before or since. The hearse was preceded by bandsmen of the *Deutscher Turn Verein*, clad in white with black arm-bands and softly playing the "Dead March" en route to the cemetery and at the graveside. Wreaths were laid from His Excellency the Governor of Victoria, the Governments of all Australian colonies, the consulates of Germany, Austria-Hungary, France and Denmark, the Lord Mayor of Melbourne, the Melbourne University, Melbourne and Sydney Botanic Gardens, and innumerable personal friends and mourners. The grave itself was bedded with roses. Rev. Hermann Herlitz read the burial service and delivered an impressive eulogy on the nobility of the deceased's character—his energy and selfless absorption in his beloved science, his boundless generosity and concern for the troubles of others. The Melbourne Liedertafel sang most beautifully to the music of Beethoven "Day again his race has run", "Holy night O soothe my breast", and "Now the labourer's task is o'er".

Five years afterwards, on November 26th, 1901, many notable citizens gathered here again to witness the unveiling of this magnificent obelisk of Harcourt granite by the first Governor-General of the Australian Commonwealth (the Rt. Hon. Earl of Hopetoun), and down the intervening fifty-six years there have been numerous pilgrimages to keep green the memory of Ferdinand von Mueller. One of his closest friends, Mr. Heinrich Best,⁷ came here every year until 1953 to pay homage with a floral tribute. We sincerely regret that the indifferent health of the dear old gentleman, now 94, prevents his attendance today—his thoughts are certainly with us.

On such an auspicious occasion as this Muellerian Centenary of Directorship, and with so many brilliant encomiums in retrospect, one is both humbled and truly conscious of the privilege in speaking to you now. "The Baron", as

⁷See H. Best, "Ferdinand von Mueller, the Man", in *Viv. Nat.*, 150: 122-7 (Oct. 1918).

he was often affectionately called, has been described by men who knew him well in such terms as these: "a star of the first magnitude", "the kindest man who ever lived", "a mental giant with the heart of a child", and "one of the most erudite, industrious, open-handed, pure-hearted and lovable physiologists the century has produced".

Who was this man of whom people wrote so warmly, almost extravagantly? Briefly the story runs thus:

Early in 1847 brilliant young Dr. Ferdinand Mueller had just graduated in philosophy at Kiel University (then part of Denmark). Both parents and his elder sister had recently died of tuberculosis, and the remaining three children were advised to migrate to a warmer climate before premature death claimed them all. They chose South Australia, and arrived at Adelaide in December 1847 after a five-months voyage around Cape Horn. Mueller found work as a chemist's assistant at 15/- a week, with ample time to indulge his botanical tastes; within four years his deep love for plant life and insatiable thirst to examine all the floral wonders of this new land, had driven him far and wide—from the Flinders Range to Mt. Gambier. Specimens were sent to Germany, later to Britain, and the young explorer won a good reputation with European authorities.

In the winter of 1852, when just 27, he came to Victoria with the intention of opening a chemist's business on the newly discovered gold-fields around Castlemaine, but about that time Governor Latrobe was looking for a colonial botanist to investigate Victoria's vegetation—then unknown to science. Muellers qualifications gained him the position, and he immediately set out upon an ambitious botanical survey of the whole colony. Melbourne's Botanic Garden, commenced in 1846, was then a comparatively small establishment, controlled by men of no particular administrative experience nor any academic training. A director with energy, vision and some scientific background was needed, and on 13th August 1857 Mueller was appointed to the post, while still continuing in office as Government Botanist.

Within a year the new Director had added some 2,700 different kinds of plants, built a pavilion and palm house (the first in Australia) and added aviaries to the zoological section—forerunner of the present Zoo. Under his genius the Melbourne Botanic Gardens soon became internationally famous; it had no rival in the Southern Hemisphere and few anywhere else. Prodigious numbers of seeds, cuttings, crates of plants and some 3,000 letters a year poured out to the farthest corners of the world. A botanic museum (precursor to our National Herbarium) was built during 1860, and in it were housed the vast collections of dried specimens and books accumulated by Mueller over the previous 15 years. It was a golden age in more ways than one, and Melbourne was botanically "on the map"—through the single efforts of this extraordinary man!

But his life was by no means a "path of roses", and he suffered much from worry, misunderstanding and ill-health. A marriage engagement was cancelled in 1863 because of failing strength and a dread that tuberculosis was imminent. By the early 1870's the Melbourne public had begun clamouring for a more attractive garden—with less scientifically arranged agglomerations of flora and more in the way of massed colour, pretty vistas, ornamental fountains, band rotundas and such like. In June 1873 the Government, doubtless under pressure, virtually deposed Mueller from his directorship and appointed William Guilfoyle, a landscape gardener, in his stead. This crushing blow humiliated him beyond utterance and left its imprint on his remaining twenty-three years; he felt he had been censured before the world, and that unjustly, and he never set foot inside his beloved Gardens again—the very mention of his former work there would agonize him to the point of tears. He continued in the single office of Government Botanist until the end—a term of forty-four years—and this cataclysm was really a blessing in disguise for posterity. It simultaneously gave the Botanic Gardens a much-

needed "face-lift" and released the erstwhile Director from administrative worries. Henceforward, he was able to devote far more time to important literary projects, and when he died his published books, pamphlets and botanical papers had reached the astonishing total of more than 800; included was a periodical of twelve volumes written entirely in Latin.

Truly, Ferdinand Mueller was the greatest botanical figure Australia has ever known, probably the most notable scientist too, and one of the really great explorers of the nineteenth century. He encouraged every possible research into plant products which might prove beneficial to man (such as eucalyptus oil and quinine bark). He introduced the now-imminently-important Monterey Pine to our forests, and Marram Grass for binding coastal sand-dunes; he fostered Antarctic exploration, and he always inspired people to find use and beauty side by side.

Mueller remained an utterly simple-hearted, loyal and approachable man, with a very high standard of responsibility and personal integrity. He was incapable of doing any mean thing, would never turn a deaf ear upon the entreaties of those whom he believed to be in want, and was not infrequently the victim of imposition. His mind was beautiful, even poetic— as many of the field labels, that he wrote for his collections in Latin, bear ample evidence. Here is the translation of a typical note accompanying a century-old specimen in Melbourne Herbarium: "Growing near perennial springs and irrigated by the melting snow." Who else could so lyrically, yet succinctly, describe the habitat of a little alpine herb? Then, he was a patron of art and music. Schiller was his favourite poet whose words ("Despair not: there are still noble hearts that glow for the august and sublime"), engraved on this granite, so aptly describe the very nature of the one whose remains lie beneath. His baronial motto, *Virtute ingenioque valimus*, was also matched by a life made strong through blended virtue and inborn genius.

What a wonderful privilege for botanists at the Melbourne Herbarium to follow in Mueller's footsteps, working in the same atmosphere of the old "Botanic Museum", handling constantly his books, handwritten notes and specimens! The deathless spirit of the founder is unconsciously but certainly absorbed.

As tangible mementoes of his invaluable services to mankind, we have a stone monument and lengthy epitaph, a medal that was struck in 1904 and that has been presented to some worthy scientist at each meeting of the Australian and New Zealand Association for the Advancement of Science, a commemorative postage stamp that appeared as late as September 1948, a biography (*By Their Fruits*) which was published the following year, a botanical journal *Mulleria* launched in February 1956, and a few place-names (Mueller River, Glen Ferdinand, etc.) scattered over the Commonwealth. But Mueller's most significant memorial remains the lovely Garden that he made world-famous, with its accompanying modern herbarium and botanical library; here are found the fruits of his own labour—living trees, pressed flowers and the books he wrote, with many others. Those national possessions are a heritage without price, and one could wish that steps might even yet be taken to purchase his house (still standing in Arnold Street, South Yarra) and ensure it against any possibility of demolition.

And so today we join to honour the memory of a splendid pioneer, who was once a "new Australian" like so many others now settling among us. We are reminded of the great part played by people of non-British stock in building a better Australia, and such a supreme example as von Mueller's should be held up before all our young people for generations to come.

—J. H. WILDE.

A NEW SPECIES OF OPISTHOBRANCHIA FROM VICTORIA (Mollusca, Gastropoda)

By ROBERT F. BURN

It is now twenty-three years since the present species of *Aglaia* under discussion was first observed and collected. In 1934, Mrs. M. E. Freanie of Altona, Victoria, forwarded a single specimen collected at Altona, Port Phillip Bay, to the Australian Museum. Miss Joyce Allan, former Curator of Molluscs at the Australian Museum, kindly sent me a copy (in 1955) of the notes and a rough sketch of the specimen and its shell made at that time (in 1934).

In 1933, Miss Allan described *Aglaia taronga* from Sydney Harbour, and although this is now thought to be a colour variety of a tropical species, it is large and very colourful. It was recorded from Swan Bay, Queenscliff (inside Port Phillip Bay), by the present writer in *J. Malacol. Soc. Aust.*, 1: 13 (1957). In 1909, Verco described a very fine shell extracted from a specimen collected at Troubridge Island, South Australia, as *A. troubridgensis*. From the size of the shell, the unknown animal of this species would have been over five inches long. This species is apparently known only from the original collection.

The species described below as new differs greatly from both the species mentioned above mainly in size. Of all the specimens known to the writer none is over 20 mm. in overall length, and the shell is consistently under 3 mm. in major diameter.

The type specimen of this species and a shell taken from a paratype have been presented to the National Museum, Melbourne.

NOMENCLATURAL POSITION OF THE GENUS

AGLAIA

Class	GASTROPODA
Sub-class	OPISTHOBRANCHIA
Order	CEPHALASPIDEA
Sub-order	Philinacea
Family	<i>Aglaiidae</i>
Genus	<i>Aglaia</i>

AGLAIA Renier, 1804.

Animal smooth, soft, dorsally separated into two shields by a transverse groove. Foot wide, truncate, continued laterally into two fairly ample parapodia divided posteriorly. Rhinophores and head appendages absent but small lumps, laminae or bristles may be present on either side of the mouth. Shell minute, internal, fragile, of very few whorls of which the last is usually free. Gill large, bipinnate, on posterior right side of body. Radula, jaws, and stomach plates absent; buccal mass large. Type: *A. tricolorata* Renier.

PLATE VIII

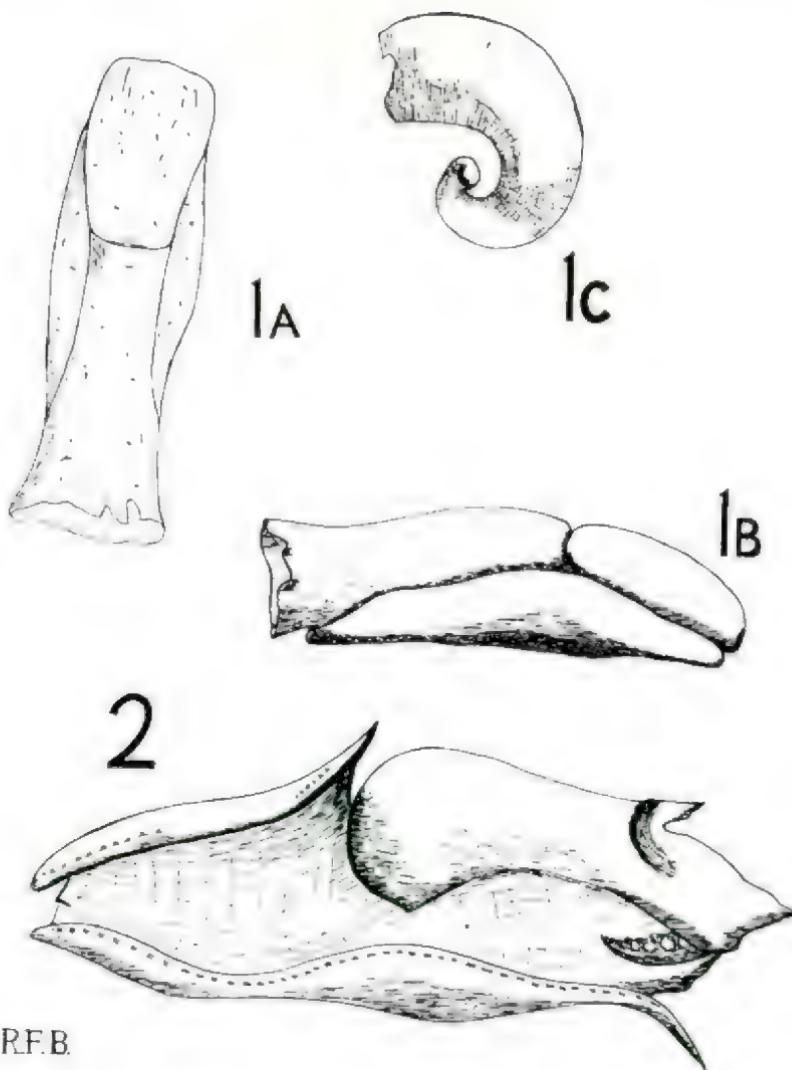


Fig. 1.—*Aglaia queritor* sp. nov.: a, dorsal aspect; b, right-lateral aspect; c, shell.

Fig. 2.—*Aglaia taronga* Allan, left-lateral aspect.

AGLAIA QUERITOR R. F. Burn, sp. nov.

Small, about 20 mm. long and 4 mm. broad. Body-form cylindrical, dorsally divided into two unequal shields, anterior shield comprising about one third of total length; ends bluntly rounded. Foot broad, continued laterally into small, short and thick parapodia always close to the body and never undulating as in other species. Posterior shield continued rearwards into a thin funnel-like membrane enclosing the shell. Gill very small, of 4 or 5 bipinnate pinnae on a single arm, in cavity formed by membrane covering free whorl of shell. Shell minute, wholly internal, of 1.5 whorls, the outer part being free, very fragile, thick along inner edge and membranous toward outer margins. General body colour velvet black flecked with light blue, anterior shield with a single blue edging on either side of the median line along the posterior edge; inner sides of parapodia pale grey, gill dull green, shell opaque white.

Habitat: Portarlington (TYPE), one specimen, Jan. 1957, R. F. Burn, Portarlington, two specimens, Aug.-Oct. 1954, R. F. Burn; Torquay, one specimen, Dec. 1954, R. F. Burn; Altona, one specimen, 1934, Mrs. Freame (in Australian Museum collection).

Station: Rare, only single specimens taken, crawling on sand and under stones (Portarlington); feeding on rotting seaweed in rock pool (Torquay).

Remarks. Some specimens are a dull yellow in general colour but these are always heavily mottled with black. When in motion, the posterior membrane is extended horizontally until it forms a cylindrical funnel, but when it is resting it is contracted. *A. taronga*, the other record of the genus from Victoria, is readily distinguished from this species. *A. taronga* has free parapodia which are wavy-edged, and the gill is large, passing completely across the body under the shell. The rear edge of the anterior shield is raised up like a protective guard, and the general body colour is striped with orange and white.

REFERENCE-

Allan, Joyce, 1933. Rec. Aust. Mus., 18 (9)
—, 1950. Aust. Shells, 216-18.

JUNIOR AGE NATURE RECORD

Junior Age is making the summer period (ending on January 31) one for holiday recording. Record books are supplied to any group of three or more junior enthusiasts who will list survivals of original Victorian flora. So far, the work carried out and examined indicates that age has little influence on its quality, but age groups, as well as the opportunities provided by a given district, will be taken into account when prizes are awarded in February. There is a tendency to overestimate the amount of necessary botanical knowledge. However, members of the Club can greatly assist the enterprise of Junior Age by leading or helping a group.

—W. WADDELL.

DEATH OF A VETERAN BRYOLOGIST (George Osborne King Sainsbury, 1880-1957)

By J. H. WILLIS*

On 22nd July, 1957, Australasia (and indeed the world) lost a very distinguished botanist whose particular interest was the moss flora of New Zealand and south-eastern Australia. Mr. G. O. K. Sainsbury died at Napier (North Island, N.Z.) within ten days of a severe chill, shortly after his 77th birthday, and there is now a gap in the ranks of the very few living austral bryologists that will be extremely difficult (if not impossible) to fill.

The fourth son of George Edward Sainsbury, a barrister and solicitor, he was born at Napier on 1st June, 1880. As a child he went to live in London, but later came back to his homeland and received an education at the Wanganui Collegiate School; three subsequent trips to Europe were made prior to 1914. He was called to the Bar about 1903 and practised as a barrister and solicitor in Gisborne (N.Z.) from then until 1911, when he took up farming for a few years. As partner with a brother, he returned to the legal profession (in 1917) at Wairoa, where he practised for the ensuing 29 years until his retirement in 1946. During December 1955 he moved from Wairoa into a smaller, more convenient house at Kopanga Road, Havelock North—a secluded situation, with over an acre of grounds.

It was not until about 1920 that Sainsbury became seriously interested in botany as a hobby, studying first the flowering plants but completely losing his heart to the lowlier Musci in 1922. Mountaineering was his great delight, and he combined moss-collecting with many a trek through the South Island and the rugged central portion of the North Island. The last time he visited Australia was in 1909, but that was long before his inclination to look for mosses. By 1927 he had begun corresponding with the foremost British bryologist, Hugh Neville Dixon—a close association that ended only at Dixon's demise in May 1944. The latter savant described a genus *Sainsburia* in his honour in 1941, and it is regrettable that the plant eventually proved to be merely a form of the highly variable little moss *Fissidens taylori*; but he is perpetuated in the name of an hepatic, *Radula sainsburiana* E. A. Hodgson. Sainsbury also exchanged specimens and ideas with other world-authorities—notably E. B. Bartram in Pennsylvania and A. Le Roy Andrews in New York. Of these three particular friends (Dixon, Bartram and Andrews) he always spoke in the warmest terms, and he respected their opinions very highly.

Between 1928 (apparently the year of his first appearance in print) and 1956, Sainsbury contributed at least 39 important papers

* National Herbarium of Victoria.

on muscological subjects to nine different scientific periodicals, including the *Victorian Naturalist* (three articles). In these publications the descriptions of one new family, two new genera, 39 new species (and many new nomenclatural combinations) are involved. Even now his monotypic new family, *Bryohartramiaecae* (1948), is known only from western Victoria.

The crowning effort of his botanical career was *A Handbook to the New Zealand Mosses* (May 1955) reviewed in this journal for December 1955 (72: 127). This handbook (490 pages and 76 plates) will be of the greatest use to students, not only in New Zealand but in Australia, too, for many years to come.

From the Australian point of view, probably his next most important work is a series of eight papers published recently by the Royal Society of Tasmania (1953-6), entitled *Notes on Tasmanian Mosses from Rodney's Herbarium* and covering 80 pages of comments on the specimens of the said herbarium (which was submitted to him by the Hobart University for thorough examination).

Although unquestionably the leading authority on Australasian *Musei*, Osborne Sainsbury was a meticulous and very humble man who neither rushed into print nor ever sought to air his knowledge—unless asked for a critical opinion, and then his years of experience would be gladly crystallized for the inquirer's benefit. He was most conservative in his ideas on speciation, as the following two excerpts (from letters accompanying determination of specimens) will serve to show:

(11/8/1953)—Just the usual polymorphous business that we meet with again and again and again—the joy of Carl Müller, Colenso and Co., but our bane. These splitters really have the best of it because, when they see a moss that looks unusual, they have only to publish it as "sp. nov." and then turn to the next one; thus they acquire merit and renown and split the ears of the groundlings.

(13/1/1955)—I have been copying out Theriot's and Brotherus's papers on the New Caledonian mosses, and have been simply horrified by the latter's "splitting". It is really incredible! I suspected that he had dealt with the austral mosses on those lines, but nevertheless was shocked to see what obvious habit-phases were raised to the rank of species... These New Caledonian papers are really on a par with C. Müller at his worst.

During many years (at least since 1927) Sainsbury was a member of the Hawke's Bay Philosophical Institute (affiliated with the Royal Society of New Zealand), and he also held membership with the British Bryological Society. At the Auckland Meeting of the Australian and New Zealand Association for the Advancement of Science in January, 1937, he read a paper on "The Affinities of Tasmanian and New Zealand Mosses". He is survived by his wife (née Edith Alice Sherratt) and two daughters, Mesdames Amy Giblin and Mildred Harper, the only son (Popham) having been killed during operations with the R.A.F. over North Africa. His

voluminous correspondence and large private moss-herbarium (of some 18,350 numbers) have gone to the Dominion Museum at Wellington—the entire and very valuable New Zealand part of this collection was donated and removed to the Museum in October 1954.

For the past decade the writer had maintained a frequent personal correspondence with "G.O.K.S.", to whom his sense of indebtedness is immeasurable. Indeed, it is doubtful whether the thorny path of Victorian bryology could have been attempted at all without Mr. Sainsbury's constant and genial encouragement—he identified scores of puzzling specimens, pointed out many subtleties and pitfalls, exercising limitless patience and tact in dealing with the often fatuous inquiries of a raw beginner. Sainsbury's enthusiasm for his hobby was infectious and his sense of humour keen. His inspirational letters would scintillate with whimsical "asides" (sometimes in Latin)—he wrote informally, just as if present and talking to one. Here is the typical response to a message of sympathy, when he had to undergo a minor operation on an arthritic wrist in September 1953:

The "op" went off all right, and I have been home for a week or so, but the plaster must remain on for three weeks. It is a big nuisance, but I can manage to type a bit. Haven't used the mike yet, but might be able to do a bit of rough work with it. Am absolutely browned off, not being able to work on the mosses as normally, and, if you have a few specimens that I could look at in a rough sort of way, then I sure would like to see them.

My file of Sainsbury letters is a cherished possession, and I am indebted both to these and to the kindness of Mrs. Sainsbury for such biographical details as have been set out above. Alas, that I never met him in person!



The late G. O. K. Sainsbury

Photo by courtesy Mrs. E. A. Sainsbury

OBITUARY: J. Y. WOOLSTENCROFT

Naturalists who visited the Neerim and Noojee districts forty and fifty years ago were assured of a warm welcome from the late Mr. Woolstencroft, who was a resident there. He was keenly interested in the big trees and forest scenes of those districts and many of his splendid photographs of fern gullies often appeared in the Melbourne weekly papers of that period.

John Young Woolstencroft was born in Bradford, Yorkshire, England, on January 4, 1871, and came to Australia with his parents in the sailing ship *Cathcart* during 1887. In 1896 he settled at Neerim Junction where he conducted a business for a number of years until the railway line was extended to Noojee, in which town he opened the first general store. After his retirement he lived at Frankston for many years and then spent the last few at Seaford where he died on August 25, at the age of 87 years.

During his long residence in Gippsland he witnessed the passing of much of the great Mountain Ash forest which flourished in the Neerim district. As this forest vanished he began exploring the rugged forest country near Mt. Baw Baw. It was on one of these trips that the "Giant Tree" on Mt. Horsfall was discovered and a photograph of this tree was published in the *Leader* in 1905. The "Neerim Giant" was another huge tree which existed near his home town at that time. Some of his photographs of fern gullies were among the best ever taken in the State and these were mostly obtained during evenings when everything was dull and quiet. Under these conditions, and with a small aperture he would give exposures of at least ten minutes and obtained excellent results. He took a prominent part in having Nayook Glen opened up for tourists in 1913, and he was also a member of the 3rd Pioneers during the First World War.

- D. J. DICKSON.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

RECONSTRUCTION OF AN ANTS'-NEST AT BABINDA, QUEENSLAND

During a short-cut through tropical scrub near Babinda on a spur of the Bellenden-Ker Range, I witnessed an interesting event concerning an ants'-nest.

A freshly broken branch from a Bush-lemon had fallen to the ground and had been opened by the fall. Large numbers of ants had come out of the nest when it had broken and many of them were in a "paric", except a small number which congregated on some green leaves already wilting in a shaft of sunlight. These ants appeared to be "balling" at this spot and making very little movement. A large proportion of them were undersize and immature with some nymphs even being present. Apparently something was being contemplated. Persistent "paratroopers" arrived from overhead and discouraged a nearer approach on my part, and the simultaneous operation of five ants caused me to retreat temporarily.

Half an hour went by before I passed that way again, but I was curious to see what had happened so I found the tree.

Very few ants were visible now except where the "balling" had been taking place, and there the conglomeration of wilting leaves and twigs had been pulled together, edges rolled flat, overlapped, and stuck together with that wonderfully fine silky-textured thread-mass secreted by the insect. The whole mass was roughly the shape and size and shape of a football, with the heavier twigs and branches up to one inch in diameter. These passed in at some places and out at others, but all were plastered down to a remarkable degree. Large numbers of ants slowly patrolled the exterior of the new nest. Several ants passed into one end of it and others left at the opposite end, but the traffic

seemed very orderly. No immature ants were visible now but a gentle rustling sound continued from the interior all the time I stood nearby. As no ferocious guards showed up I was encouraged to place a hand on a branch of the Bush-lemon for support. Several dead leaves were intermingled with the green ones just there and when I touched them a rustling and rattling sound began and lasted several seconds. While I watched the endeavours of the green ants, I brushed the twigs and leaves again. The rattling was louder and longer than before and seemed like a match-box shaken some feet away.

No apparent cause for this activity was evident so I parted the leaves and peered closer. Then things happened. Several jet-black ants, about three-sixteenths of an inch long, came out of their home which consisted of a single dead leaf completely curled and apparently sealed at both ends. They raced on to their one-leaf home, crowded there and vibrated up and down on the spot at a violent rate, with all their heads facing my way. No wonder they rustled and rattled. I watched for a while and then the "dance" finished. All the ants rushed pell-mell into the leaf-home through a hole about the size of a wax vesta. I could not resist one more tap at the twigs. Pandemonium broke out again and was more violent than ever, but as I watched the "jigging" more closely, the ants scored a victory. The sickening smell of their acid penetrated the air nearby and a sudden intense smarting on my face told me that I had been well shot. I departed with feelings of respect for both varieties of ants and regretted that I had no camera to record these events.

When I am in that vicinity again I will collect some of that beautiful and fine-threaded ants' secretion which is so strong and interesting. Incidentally, the microscope specimens which I intended to collect originally had to wait. Nature springs surprises when they are least expected.

—A. G. F. Follows.

WHAT, WHERE, AND WHEN

F.N.C.V. Meetings:

Monday, December 9—Lecture by Mr. J. M. Landy.

Monday, January 13—Members' Night.

Monday, February 10—"Sherbrooke and its Lyrebirds", by Mr. Halafoff.

Monday, March 10—"Our Natural Resources", by Miss Ina Watson.

F.N.C.V. Excursions:

Sunday, December 15—Entomology and Marine Living Group excursion to Seaford. Take the 8.53 train from Flinders Street to Seaford. Bring one meal and a snack.

Thursday, December 26—Wednesday, January 1—Parlour-coach excursion to Genoa district. The coach will leave Flinders Street, opposite the Gas Company, at 7.30 a.m. sharp. Bring two meals. Members are requested to pay the remainder of the bus fare before, or at, the December meeting. Other details of this excursion have been given in the *Victorian Naturalist* for September.

Group Meeting:

Friday, December 13—Botany Group. Speaker: Mrs. Pinches. The Group will meet in Mr. Lord's room at 514 Little Collins Street at 8 p.m. (between King and William Streets).

Preliminary Notice:

Sunday, January 19—Parlour-coach excursion to Point Lonsdale. Leader: Mr. E. H. Coghill. Local members may join party at Eastern Beach, Geelong, at approximately 10.30 a.m., or at Marcus State School at about 11.30 a.m. Coach leaves Batman Avenue at 9 a.m. Fare, 18/- for Melbourne members. Bring two meals. Bookings with Excursion Secretary

MARIE ALLENDER, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7.

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HENRY KINGSLEY AS A NATURALIST

By N. A. WAKEMAN

In the introduction to one edition of Henry Kingsley's first book, *The Recollections of Geoffrey Hamlyn*, we read that it is "a pioneer among colonial and Australasian novels"; and perusal of its pages reveals that the author was a well-informed and observant naturalist. He was born in 1830, came to Australia in 1853, and the first edition of the novel appeared in 1859. Thereafter, until his untimely death in 1876, he averaged a book a year.

From the eighteenth chapter onward, the setting of the *Recollections* purports to be in the Monaro district of southern New South Wales, and, though it becomes evident that details of topography are fictitious, almost every chapter contains some element of natural history very appropriate to the region. As the story is told, the scenario contains such details as:

Flaming lorries and brilliant parroquets¹ fly whistling, not unmusically, through the gloomy forest, and overhead in the higher fields of the air, still lit by the last rays of the sun, countless cockatoos wheel and scream in noisy joy . . .

Below us, in the valley, a mob of jackasses² were shouting and laughing uproariously, and a magpie³ was chanting his vesper hymn from a losty tree.

Moiria Creek . . . the most troubled locality for snakes diamond, black, carpet, and other . . . These waterholes were the haunt of the platypus and the tortoise. Here, too, were flocks of black duck and teal, and as you rode past, the merry little snipe would rise from the water's edge, and whisk away like lightning through the trees.

A wee native bear, barely eight inches long—a little grey beast, comical beyond expression, with broad flapped ears. . . . his mother sits aloft, grunts indignantly at the abstraction of her offspring, but . . . goes on with her dinner of peppermint leaves.

. . . a thousand parrots flew swiftly in flocks, whistling and screaming from tree to tree, while wattle-birds and numerous other honey-eaters clustered on the flowering banksias. The spur-winged plover and the curlew ran swiftly among the grass, and on a tall dead tree white cockatoos and blue cranes⁴ watched the intruders curiously.

. . . a glorious violet and red King-fisher⁵ perched quite close and, dashing into the water, came forth with a fish, and fled like a ray of light along the winding of the river. A colony of little shell parrots,⁶ too, crowded on a bough, and twittered and ran to and fro quite busily . . .

* Published December 16, 1957.

Kingsley's characters had the habit of appearing dramatically and unexpectedly in the scene, even though they had been left on the other side of the world. Thus, Frank Maberly, the curate of Drumston, Devon, becomes a Dean in New South Wales. And we read of his merry laugh:

sending the watchman cockatoo screaming aloft to alarm the flock, or startling the brilliant thick-clustered lorries⁷ (richest coloured of all parrots in the world), as they hung chattering on some silver-leaved acacia, bending with their weight the fragile boughs down towards the clear still water, lighting up the dark pool with strange, bright reflections of crimson and blue; startling, too, the feeding doe-kangaroo, who skipped slowly away, followed by her young one—so slowly that the watching travellers expected her to stop each moment, and could scarcely believe she was in full flight till she topped a low ridge and disappeared.

It is likely that a person of Kingsley's obvious interest in natural history would have made the acquaintance of Dr. Ferdinand Mueller, German emigrant and newly appointed Victorian Government Botanist; and one wonders if the latter is the original of the author's "Dr. Mulhaus" whom we see at one stage "kneeling in spectacles before his new *Grevillea victoriae*, the handsomest of the Grevilleas, the first bud of which is bursting into life". (Mueller originally described his *Grevillea victoriae* in 1855.)

And one wonders too if Dr. Mueller ever thought as Kingsley has Dr. Malhaus speak:

If Linnaeus wept and prayed over the first piece of English furze which he saw, what everlasting smelling-bottle hysterics he would have gone into in this country!

It is the chapter about "How they all went hunting for sea anemones at Cape Chatham" that the naturalist in Henry Kingsley is most apparent. His description seems to be of Green Cape, on the south coast of New South Wales, and the following extracts are surely an account of his own excursion there a hundred years ago. Here are four of the passages:

The atmosphere was so amazingly pure, that miles away across the plains the travellers could distinguish the herds of turkeys (bustards) stalking to and fro . . .

Then a green swamp; through the tall reeds the native companion, king of cranes, waded majestic; the brilliant porphyry water-hen,⁸ with scarlet bill and legs, flashed like a sapphire among the emerald green water-sedge. A shallow lake, dotted with wild ducks, here and there a group of wild swan, black with red bills, floated calmly on its bosom. . . . A sudden rocky rise, clothed with native cypress (*Exocarpus*—Oh my botanical readers!), honeysuckle (*Bauhinia*), she-oak (*Casuarina*), and here and there a stunted gum . . . and soon they saw the broad belt of brown sandy heath that lay along the shore.

Now they began to see the little red brush kangaroo,⁹ and the grey forester,¹⁰ skipping away in all directions; and had it been summer they would have been startled more than once by the brown snake, and the copper snake, deadliest of their tribe. The painted quail, and the brush quail¹¹ (the largest

of Australian game birds, I believe), whirred away from beneath their horses' feet; and the ground parrot,¹² green, with mottlings of gold and black, rose like a partridge from the heather, and flew low. Here, too, the Doctor flushed a "White's thrush",¹³ close to an outlying belt of forest, and got into a great state of excitement about it. "The only known bird," he said, "which is found in Europe, America, and Australia alike." Then he pointed out the emu wren, a little tiny brown fellow, with long hairy tail feathers, flitting from bush to bush, and then, leaving ornithology, he called their attention to the wonderful variety of vegetation that they were riding through; Hakeas, Acacias, Grevilleas, and what not. In spring this brown heath would have been a brilliant mass of flowers; but now, nothing was to be seen save a few tall crimson spikes of Epacris, and here and there a bunch of lemon-coloured Correas.

Then gazing down once more, she saw beneath the crystal water a bed of flowers, dallias, ranunculus, carnations, chrysanthemums, of every colour in the rainbow save blue. "Sea anemones," said the Doctor, "actinias, seputas and sabelas . . . there is nothing I ever have seen like that great crimson fellow with cream-coloured tentacles. I suspect he has never been described. The common European anemone they call *frutescens* is something like him, but not half so fine."

Even when the heroes of the book, together with Captain Desborough and his troopers, had the terrible Tuan and his bushranger gang at bay, and "every golden fern-bush, and every coign of vantage among the rocks, began to blaze and crackle with gun and pistol shot", Kingsley did not forget that it was the Australian countryside still:

All about among the fern and the flowers, among the lemon shrubs, and the tangled vines, men fought, and fired and struck, and cursed; while the little brown bandicoots scuttled swiftly away, and the deadly snake hid himself in his darkest lair, affrighted.

And when the leader of the "miscreants" escaped and set about crossing the snow-covered alps, we learn that it was

Not for him to see, as he went on and on, how the hardy Dicksonia still nestled in stunted tufts among the more sheltered side gullies, long after her tenderer sister, the queenly Alsophila, had been left behind¹⁴ . . . His horse's feet brushed through the delicate asplenium,¹⁵ the Venus'-hair of Australia; the sarsaparilla¹⁶ still hung in scant purple tufts on the golden wattle, and the scarlet correa lurked among the broken-quartz.

So the author takes necessary precautions to ensure that the flora is properly appreciated, insisting that we

go up with him, not cursing heaven and earth, as he did, but noticing how, as we ascend, the scarlet wreaths of Kennedia and the crimson Grevillea give place to the golden Grevillea and the red Epacris; then comes the white Epacris, and then the grass trees, getting smaller and scantier as we go, till the little blue Gentian, blossoming boldly among the slippery crags, tells us that we have nearly reached the limits of vegetation.

The reader who knows our alpine plants will say that Kingsley is rather wide of the mark in this last passage, but such a lapse should not detract from the pleasure of encountering, in a dramatic novel, the "morepork chanting his monotonous cry", the "little

grey flying squirrel", the "great grey muths (Bougongs)", the "native passion-flower, scarlet and orange". and a host of other acquaintances of the Australian naturalist

But what is "the tender sweet-scented oxalis, the winter flower of Australia"?

NOTES

1. These "parroquets", referred to elsewhere as "an exceedingly beautiful parrot . . . a Blue Mountain", are evidently our Rainbow Lorikeet.
2. "Dacelo gigantea", according to an author's footnote, this being a synonym for *D. gigas*, the Laughing Kookaburra.
3. An author's footnote describes the bird: "Magpie, a large, pied crow. Of all the birds I have ever seen, the cleverest, the most grotesque, and the most musical. The splendid melody of his morning and evening song is as unequalled as it is undescribable."
4. White-faced Heron.
5. This is the Azure Kingfisher, which is actually blue and orange in colour.
6. Budgerigar.
7. Crimson Rosella.
8. Eastern Swamphen, *Porphyrio melanotus*.
9. Red-necked Wallaby.
10. The common Great Grey Kangaroo used to be called the "Forester".
11. Brown Quail.
12. Now rare, the Ground-parrot, *Pesopeltis seculicrus*, may still be seen in the heathlands near Green Cape.
13. This seems to apply to the Australian Ground-thrush. The bird is confined to eastern Australia, but there are closely related species overseas.
14. Soft Treefern, *Dicksonia antarctica*, and Rough Treefern, *Cyathea australis*, respectively.
15. Evidently this is an error for *Adiantum*, the genus to which our Common Maidenhair belongs.
16. Purple Coral-pea, *Hardenbergia violacea*.

MOOMBA NATURE SHOW

This show will be staged in Preston Motors Showroom from Saturday, March 8, until Saturday, March 15, 1958. It will be officially opened on March 8, at 2.30 p.m., by the Lord Mayor of Melbourne and will close at 9.30 p.m. on the following Saturday. It will be an integrated show by Melbourne's natural history organizations, including the F.N.C.V. Special features planned include short series of appropriate colour slides and films, and Mr. Alex Walker, the well-known bird-call imitator, will demonstrate his skill. Special attention will be paid to growing native plants and garden- and nursery-grown wildflowers will probably be shown. Volunteers from the Club are required to help with running the show. The structural part will be set up on the evening of March 6, the background of plants arranged on the following day, and the dismantling on March 17. Since many visitors, especially school children, are expected, supervisors will need to be rostered for duty between 9.30 a.m. and 9.30 p.m. each day of the show. Members of the Club who are able to help in any of the above-mentioned ways are urged to send their names to either the President or Honorary Secretary as soon as possible so that the organizing committee will know the resources it can use.

Remember, we hope that members of the Club will make a worthwhile contribution to this show which will be an outstanding feature of the Moomba Carnival. For this purpose, it is hoped that as many members as possible will assist.

A LIST OF VICTORIAN CLAVARIACEAE (With an artificial key to the eleven genera of known representation in the State)

By J. H. WILLIS*

INTRODUCTION

Since the appearance of M. C. Cooke's *Handbook of Australian Fungi* in 1892, there have been three important, descriptive publications embracing the "coral fungi" (Clavariaceae) of Victoria—all within the past two decades, viz. by J. B. Cleland³, S. G. M. Fawcett² and E. J. H. Corner.¹ The last author's comprehensive world monograph (720 pages, 298 text figures and 16 colour plates) appeared in 1950 and involved many radical changes in nomenclature and in generic concepts: for instance, the old genus *Clavaria* of other writers in our fungi has been split into at least seven derivative genera.

Corner¹ shows that, of Cooke's⁴ 25 clavariaceous species attributed to Victoria, 7 were synonymous with other species dealt with, while 4 are very doubtfully Victorian and may be the result of mis-determinations. He synonymizes 17 of the specific names used by Fawcett in her critical *Studies*² of 1939/40, including two of her own new species (*Clavaria pallidorosea* and *C. caeruleolorosa*). With the necessity for such sweeping adjustments in this group of very beautiful and popular fungi, it is desirable that an up-to-date list of Victorian species be published.

The following census of 36 Victorian members has been adopted from Corner's monograph, and includes those names from the three above-mentioned Australian publications^{2, 3, 4} which have now been reduced to synonymy. Genera and their constituent species are alphabetically arranged, and all species endemic in Australia carry the prefixing (†); ten of these endemites occur in Victoria, *Physalacria australiensis*, *Ramaria capitata*, *R. filicicola* and *Ramariopsis lorithamnus* being peculiar to that State (as far as existing records would indicate). *Clavulina complanata* is presented as, apparently, a new record for Victoria—on the writer's field observations. Five species from neighbouring States are interpolated in smaller type, since it is most probable that they will eventually be found to occur in Victoria also. Corner's colour plates of several widely distributed taxa are cited, and for each species on the list brief notes are provided regarding habit and colour; unless otherwise stated, the habitat is terrestrial. This paper concludes with an

* National Herbarium of Victoria.

artificial key to Victorian genera, which is based upon Corner's work, but it must be borne in mind that the key characters are drawn up from Victorian representatives and may not always apply to species occurring elsewhere.

ALPHABETICAL ARRANGEMENT OF SPECIES

APHELARIA

DENDROIDES (*Jungh.*) *Corner*, 1950 [Corner¹ t. col. 14 (middle)]—To 7 cm.; much branched and of tough texture; dingy-white, clay-coloured, buff or greyish.
[syn. *Clavaria lurida* Knichbr.⁴]

CLAVARIA

ACUTA *Fr.*, 1821 [Corner¹ t. col. 2 (4)]—2-5 cm.; simple and very fragile; shining white.

VERMICULARIS *Fr.*, 1821—To 8 cm. (usually much less); simple; white, pale yellowish with age.
[syn. *C. fragilis* Fr.⁴; *C. muelleri* Berk.⁴]

ZOLLINGERI *Lér.*, 1846 [Corner¹ t. col. 1 (1-2)]—To 8 cm. (usually much less); copiously but loosely branched to almost simple, delicate; deep violet or amethyst to lilac-pink, often with slaty-grey or brownish tints.

[syn. *C. nymmaniana* P. Henn.²; ?*C. bissozeriana* sens. Fawc.², non Sacc.]

CLAVARIADELPHUS

JUNCEUS (*Fr.*) *Corner*, 1950—To 15 cm.; simple and filiform (on dead leaves and twigs in rain-forest); pallid ochraceous to drab.

CLAVICORONA

PYXIDATA (*Fr.*) *Doty*, 1947,

var. ASPEROSPORA (*Fawcett*²) *Corner* in obs., 1950—To 12 cm.; copiously and pyxidately branched, toughly gelatinous with peppery taste (on logs and other dead wood); pinkish-cinnamon or clay-coloured to hazel-brown.

CLAVULINA

CINEREA (*Fr.*) *Schroet.*, 1888 [Corner¹ t. col. 4 (1)]—To 10 cm.; stout, variously branched, longitudinally rugulose, sometimes cristate; grey to darkly cinereous from the first, or frequently tinged purplish.

CRISTATA (*Fr.*) *Schroet.*, 1888 [Corner¹ t. col. 4 (4)]—To 8 cm. (often much less); much branched and exceedingly variable, generally cristate; white at first, often becoming yellowish, ochraceous or even fuliginous.

[incl. *Clavaria coraloides* *Fr.*—ut var. *coraloides* Corner, 1950. Romell (also Fawcett²) failed to find any "distinct limit" between *C. cinerea*, *C. cristata* and *C. rugosa* *Fr.*]

COMPLANATA *Corner* (nr. nom. nov.), 1950—To 15 cm.; with slender branches, much flattened upwards; creamy-white to pale apricot ("pale pinkish tussore, becoming brownish"³)

[syn. *Clavaria complanata* Clel.³ non de Bary. A New South Wales species, apparently new to Victoria where noted by J. H. Willis at Creswick (1931) and Cockatoo (6/1934, 4/1936)]

SUBRUGOSA (*Clel.*) *Corner*, 1950 [S.A.]—To 5 cm.; simple or irregularly branched, rugose; "white to pale greyish-brown".

TASMANICA (*Berk.*) *Corner*, 1950 [Tas.]—To 4 cm.; simple and solitary (on tree-fern trunks); fuliginous.

VINACEO-CERVINA (*Clel.*) *Corner*, 1950 [S.A.]—To 5 cm.; irregularly branched; vinaceous fawn.

CLAVULINOPSIS

AMOENA (*Zoll. & Mor.*) *Corner*, 1950 [Corner¹ t. col. 8 (3, 6)]—To 12 cm.; simple or forked, cylindric to flattened, often rugulose; pale lemon-yellow to bright orange-yellow or apricot.

[syn. *Clavaria aurantia* sens. Clel.³ Fawc.² non Pers. ex Karst., nec Cke. & Mass.; *C. fusiformis* sens. Clel.³ Fawc.² non Fr.; *C. inaequalis* sens. Cke.⁴ non Fr.; *C. pallidorosea* Fawc.²]

†ARCHIERI (*Berk.*) *Corner*, 1950—To 12 cm. (usually much less); simple, cylindric or somewhat flabellate; orange.

[syn. *Clavaria aurantia* Cke. & Mass.⁴ non Pers. ex Karst.; ?*C. pulchra* sens. Fawc.² non Peck.]

BIFORMIS (*Atk.*) *Corner*, 1950—To 4 cm.; simple or several times slenderly branched; dull white to buff.

[syn. ?*Clavaria subtilis* sens. Fawc.² non Fr.]

†CINNAMOMEA (*Fawc.*²) *Corner*, 1950—To 5 cm.; slightly and dichotomously branched, with flattened axils, or rarely simple; cinnamon to pinkish-buff.

[syn. ?*Clavaria umbrinella* sens. Fawc.² non Sacc.]

CORALLINO-ROSACEA (*Clel.*) Corner, 1950—To 12 cm.; simple or rarely slightly branched; vivid coral-pink to coral-red.

[syn. *Clavaria rosea* sens. Cke.,⁴ non Fr.]

CORNICULATA (*Fr.*) Corner, 1950 [Corner¹ t. col. 10 (1)]—To 8 cm.; usually 2 or 3 times dichotomously branched from a slender base; egg-yellow to ochraceous-yellow.

[syn. *Clavaria fastigiata* Fr.,⁴ *C. muscoides* Fr.,^{2,4}]

†LUTEOSTIRPATA (*Fawc.*) Corner, 1950—To 7 cm.; simple, rarely bifid; stem distinct and shining yellow, club often flattened and pale yellow.

[Corner¹ suggests that this may be a form of the variable *C. amoena*.]

MINIATA (*Berk.*) Corner, 1950 [Corner¹ t. col. 7 (4, 7)]—To 10 cm. (occasionally to 15 cm.); simple, but often flattened and variously dilated; whole rich orange-pink to flame orange.

[syn. *Clavaria caepicolorosa* Fawc.²; *C. mayabeana* sens. Fawc.,² non Imai—a monstrous condition, known as "Flame Fungus".]

var. *sanguinea* Corner, 1950 [Corner¹ t. col. 7 (2-3)]—deep rose-red to blood-red.

[syn. *Clavaria cardinalis* Boud. & Pat.]

DEFLEXULA

FASCICULARIS (*Bres. & Pat.*) Corner, 1950 [Corner¹ t. col. 15 (4), as *D. lilaceo-brunnea* sp. nov.]—To 8 mm.; clusters of simple or sparingly branched, deflexed, spine-like, ± tough teeth (on damp dead wood); pale fawn, whitish or with lilac tints.

[syn. *D. lilaceo-brunnea* Corner¹—recorded as new to Australia by D. A. Reid in *Kew Bull.* 1957: 133 (1957), on the basis of a collection from Tarra Valley, Vic. (N. E. M. Walters, 14/9/1955); otherwise known only from Malaya, Sumatra, Philippines and Samoa.]

LENTARIA

MUCIDA (*Fr.*) Corner, 1950 [Tas.]—To 20 mm.; mostly simple, sometimes forked into 2-6 ascending branches; white to pale yellowish.

[syn. *Clavaria alba* sens. Lloyd, non Pers.]

MYXOMYCIDIUM

†PENDULUM Mass., 1899—5-15 mm.; solitary, pendulous, obconic (on old wood); white, hyaline and watery-gelatinous.

[Recorded by J. H. Willis in *Vict. Nat.* 52: 76 (Aug.

1935) as new to Victoria—from Sherbrooke Forest (1935), also noted at Cockatoo (1935) and Daylesford (7/1937). J.H.W.]

PHYSALACRIA

†AUSTRALIENSIS Corner, 1950—4-13 mm.; single but gregarious, capitate (on old wood); white becoming yellowish.
[syn. *P. inflata* sens. Fawc.², non (Schw.) Peck.]

PTERULA

PHYLLOPHILA (McAlp.) Corner, 1950 [Tas.]—To 25 mm.; simple or with few irregular divaricate branches; white to pale ochre.

RAMARIA

BOTRYTOIDES (Peck) Corner, 1950—To 12 cm. high x 20 cm. broad; massive, copiously branching from ground; pallid cream below, pinkish toward the rose-pink abortive tips.
[syn. *Clavaria botrytis* sens. Cke.⁴ Fawc.² non Fr.]

†CAPITATA (Lloyd) Corner, 1950—To 10 cm. high x 20 cm. broad; massive, cauliflower-like, copiously branched with adherent, paler, swollen capitate apices; maize yellow to pallid orange-yellow, with dull honey-yellow tips.

CRISPULA (Fr.) Quél., 1888—To 5 cm. or more; resilient, slender, divaricately branched (on wood and woody debris); tan to creamy-ochre.

†FILICICOLA (Fawc.²) Corner, 1950—2-4 cm., with many crowded slender branches (on tree-fern trunks); pure white or maize to ochraceous-buff.

FLACCIDA (Fr.) Ricken, 1918—To 6 cm.; slender, with erect crowded branches (under pines); pale cream to cinnamon or brownish-ochre.

[syn. *Clavaria abietina* sens. Cke.⁴ Fawc.², non Fr.]

FLAVO-BRUNNESCENS (Atk.) Corner, 1950,
var. AUREA (Coker) Corner, 1950—To 15 cm. high x 20 cm. broad; bulky, irregularly much-branched; ochraceous-buff to rich orange-yellow.

[syn. *Clavaria flava* sens. Cke.⁴ Fawc.² non Fr., *C. flava* Fr., var. *aurea* Coker.]

FORMOSA (Fr.) Quél., 1888—To 20 cm. high (or more) x 15 cm. broad; much branched from base (bitter to taste and poisonous); pinkish-buff to orange-pink, with lemon-yellow tips or wholly pale yellow.

FUMIGATA (Peck) Corner, 1950—To 10 cm. high and broad: often massive, with crowded branches; wholly lilac, becoming dark-ochraceous or bistre, but violet hues persisting at the tips.

[syn. *Clavaria fennica* sens. Coker, Fawc.² non Karst.]

GRACILIS (Fr.) Quél., 1888 [Corner¹ t. col. 13 (5)]—To 10 cm. high x 5 cm. broad; slender, sparingly to much branched (under pines); white or clay coloured to cinnamon.

HOLORUBELLA (A. t.) Corner, 1950—To 20 cm. high and broad; much but loosely branched; cinnamon or light tan to rosy-vinaceous.

[syn. *Clavaria australiana* Clel.³; *C. rufescens* sens. Coker, Fawc.² non Fr.]

TOCHRACEO-SALMONICOLOR (Clel.) Corner, 1950—To 15 cm. high and broad; compact, massive, much branched; light yellow to ochraceous-salmon or pinkish-orange.

[The expanded and cauliflower-like tips are almost intermediate in character between those of *R. capitata* and *R. flavo-brunneascens* var. *aurata*.]

SANGUINEA (Coker) Corner, 1950—To 8 cm. high and broad; cauliflower-like, with numerous branches; pale creamy-white to egg-yellow, all parts turning blood-red or brownish-red when bruised.

†SINAPICOLOR (Clel.) Corner, 1950—To 10 cm. high and broad; rather slender but much branched; pale yellow, mustard- or orange-yellow.

[Near *R. flavo-brunneascens*, but much more slender; sometimes forming "fairy rings" in the forest.]

STRICTA (Fr.) Quél., 1888,

var. CONCOLOR Corner, 1950—To 8 cm. high x 5 cm. broad; with numerous fastigiate slender branches (on woody debris; odour often fragrant or radish-like); pallid tan to cinnamon-brown, becoming reddish-brown.

[syn. *Clavaria stricta* sens. Coker, Fawc.² non Fr.]

RAMARIOPSIS

CROCEA (Fr.) Corner, 1950—1-5 cm.; slender and delicate, with a few laxly dichotomous branches; golden yellow to chrome-orange.

[syn. *Clavaria kuhlbrenneri* F. Muell.⁴]

†LORITHAMNUS (Berk.) Corner, 1950—To 4 cm.; with a few straight branches; "pallid umber".

[Fawcett² synonymized this under *Ramaria stricta* (Fr.)]

Quél., remarking: "there is no doubt that *Clavaria lorithamnus* is merely an abnormal form of it."]

Cooke's⁴ records for Victoria of *Clavaria argillacea* Fr., *C. krombholzii* Fr., *C. pistillaris* Fr. and *C. rosea* Fr. are very dubious and the specimens upon which they were based need to be carefully checked.

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3. Cleland, J. B.—Toadstools and Mushrooms and Other Larger Fungi of South Australia 2: 263-269 (Govt. Printer, Adelaide, June 1935).
4. Cooke, M. C.—Handbook of Australian Fungi: 198-204 (1892).

ARTIFICIAL KEY TO GENERA IN VICTORIA

1. Fruiting body simple or branched; if ever less than 20 mm. high and growing on wood, then neither deflexed nor swollen at apex 3
Fruiting-body simple or slightly branched, in small clusters, minute (to 8 mm. long), consisting of pale brown, whitish or lilac, downward-pointing spines (growing on wood) *Deflexula*
Fruiting-body always simple, very small (to 15 mm. long), whitish, with a much swollen apical head 2
2. Head erect, rounded *Physalacria*
Head pendulous, oboconic (watery-gelatinous) *Myromycidium*
3. Branches pyxidate, with sterile cyathiform and proliferating apices (flesh toughly gelatinous, usually with peppery taste; large gloeocystidia present; habitat on wood) *Clavicorona*
Branches never pyxidate nor cyathiform at apices (flesh not tough and gelatinous; no gloeocystidia; habitat not on wood, but sometimes on fallen leaves and twigs) 4
4. Spores pale yellow to ferruginous, ellipsoid and usually with several guttulae (fruiting-bodies branched, often much so, and usually massive) *Ramaria*
Spores white, usually subglobose, 1-guttate or sometimes aguttate . . . 5
5. Hyphae without clamp-connections, secondarily septate (giving a juicy-brittle texture to the fruiting-body) *Clavaria*
Hyphae without clamps, but not secondarily septate (texture tough and almost leathery) *Aphelaria*
Hyphae bearing clamps, not secondarily septate (texture various, but not very brittle nor leathery) 6
6. Basidia subcylindric; sterigmata 2 (fruiting-bodies usually with irregular flattened branches) *Clavulinopsis*
Basidia clavate; sterigmata 4 7
7. Spores finely echinulate; fruiting-bodies with a few branches *Ramariopsis*
Spores smooth; fruiting-bodies usually simple and often vividly coloured 8
8. Habitat terrestrial, spores 1-guttate *Clavulinopsis*
Habitat on dead leaves and fallen twigs; spores aguttate (fruiting-body filiform) *Clavariadelphus*

SOME ERRONEOUS BIRD RECORDS FOR GIPPSLAND

By N. A. WAKEFIELD

Recently, the writer summarized the information available on the birds of Gippsland, from *The Emu*, *The Victorian Naturalist*, *B.O.C. Monthly Notes*, and other sources. It is obvious that a number of erroneous reports have been published from time to time, and the purpose of the following comments is to place on record corrections and queries in connection with some which appeared in the *Victorian Naturalist*. This should be of value when an index is prepared to the journal.

The "Checklist" referred to below is the *Official Checklist of the Birds of Australia*, compiled by a committee of the Royal Australasian Ornithologists' Union and published in 1926.

1. Ref. *Vict. Nat.* 1: 103-104—"Descriptions of Some Australian Birds' Eggs Not Previously Described", by T. P. Lucas.

p. 104, WHITE-WINGED PETREL. The report read, "Early last season a friend brought in the eggs of this species from some of the small islands off East Gippsland."

According to the Checklist, this species (*Pterodroma leucoptera*) breeds at Cabbage Tree Island, off Port Stephens, N.S.W. Possibly Lucas confused the locality with Cabbagetree in East Gippsland; in any case the species has not been authentically recorded for Victorian seas.

2. Ref. *Vict. Nat.* 2: 150-154—"To Wilsons Promontory Overland", by J. B. Gregory and A. H. S. Lucas.

p. 153, COCKATOO PARROT. This species has not otherwise been recorded for Gippsland, and it is extremely unlikely that the record for Wilsons Promontory is correct.

p. 153, "Flocks of little LOVE BIRDS". This name is normally applied to the Budgerigar, which species has never been authentically recorded for Gippsland. In this case the species observed would have been the Blue-winged Parrot (*Neophema chrysostoma*), a bird often noted in the area.

3. Ref. *Vict. Nat.* 3: 39—A "Whistling Owl" is reported as having been exhibited at a F.N.C.V. meeting (12/6/1886) by Mr. C. French. The identity of the specimen remains obscure; possibly it was the Winking Owl (*Ninox connivens*).

4. Ref. *Vict. Nat.* 6: 1-38—"Trip to Croajingolong", by Baldwin Spencer and C. French. On page 33 one reads, "Of birds, the following list (kindly supplied to us by Mr. C. Frost) gives the names of those noted." They include these four:

p. 33, *Pardalotus quadragintus*. This name applies to the FORTY-SPOTTED PARDALOTE, which is endemic in Tasmania. The bird observed was evidently the Spotted Pardalote (*P. punctatus*), which is common in the area concerned but which was not mentioned by the writers.

p. 33, *Drymodes brunneopygia*. This is the SOUTHERN SCRUB-ROBIN, a bird confined to the Mallee of Victoria, South Australia and Western Australia. The origin of this erroneous record is obscure.

p. 33, *Melithreptus gularis*. It is most unlikely that this bird, the BLACK-CHINNED HONEYEATER, was met with in the areas visited. Evidently, the bird seen was the White-naped Honeyeater (*M. lunatus*) which, though common in the forests of Croajingolong, was not mentioned by the writers (See Note 1 below.)

p. 33, *Characteris scandens*. The species referred to, the BROWN TREE-CREEPER (= *C. picumnus*), does not occur in the areas visited by Speefer's party. On the other hand, the White-throated Tree-creeper (*C. leucophrys*), which was not mentioned in the report, is abundant throughout the country concerned. (See Note 2 below.)

3. Ref. *Vict. Nat.* 12: 76-81—"Trip to Mallacoota Inlet", by O. Le Souef.

p. 79, BROWN TREE-CREEPER. From the context, this report applies to the Cann River district. The preceding comment applies also in this case.

p. 80, OSPREY. A pair are reported from along the Genoa River on the way to Mallacoota. This is evidently an error based on observation of Whistling Eagles (*Haliaeetus sphinx*), which are generally to be seen in the place concerned but which are not included by the writer in his report. (See Note 3 below.)

6. Ref. *Vict. Nat.* 13: 18-22—"A Trip to Mallacoota", by D. Le Souef.

p. 19, "Little Brown Sericornis". This is reported nesting at Tonghi Creek. The name applies to the BROWN SCRUB-WREN (*S. humilis*), which according to the Checklist, is endemic in Tasmania and Bass Strait Islands. There is some doubt as to whether this species is specifically distinct from the mainland White-browed Scrub-wren (*S. frontalis*), and some observers believe that certain mainland specimens are not different from some of *S. humilis* from Tasmania. However, as typical *S. frontalis* occurs plentifully at Tonghi Creek but is not mentioned by Le Souef, no significance should be attributed to his use here of the name of the Tasmanian bird.

p. 20, BROWN TREE-CREEPER. This is included in a list "Nests and eggs found in country around Mallacoota". Again the writer seems to have mis-identified the White-throated Tree-creeper.

7. Ref. *Vict. Nat.* 15: 60—Under the title "A New Bird for Victoria", A. J. Campbell wrote, "The Great Sandpiper, *Tringa crassirostris*, exhibited at the August meeting of the Field Naturalists Club of Victoria, was collected by Mr. J. B. Mason, of the Ports and Harbours Department, at the Gippsland Lakes, during the autumn of 1895". The species is now known as the GREAT KNOT (*Calidris temminckii*).

In *Nests and Eggs of Australian Birds*, on page 822, Campbell corrected this record thus: "In exhibiting a skin before the F.N.C.V., 1898, I was somewhat too hasty in extending the locality (i.e. of *T. crassirostris*) to Victoria. Afterwards . . . I proved it to be the Common Knot." (See Note 4 below.)

8. Ref. *Vict. Nat.* 25: 149-151—"Biological Survey of Wilsons Promontory". On page 149 is the sub-heading "Report on Zoology by P. R. H. St John", under which appear:

p. 150, *Glycypitta albirostris*, WHITE-FRONTED HONEYEATER. But the habitat of this bird is the dry inland part of the State. It is not known to what species this report actually applies.

p. 150, *Neophema elegans*, Grass Parrakeet. This name applies to the ELEGANT PARROT, which does not occur in Gippsland. The bird observed would be the similar Blue-winged Parrot (*N. chrysostoma*).

p. 150, *Pachycephala gilberti*, Red-throated Thickhead. The GILBERT WHISTLER (*P. inornata*), as the bird is now called, inhabits dry inland areas of the State. This record would apply to a juvenile phase of the Olive Whistler (*P. olivacea*), a species which occurs on Wilsons Promontory.

p. 150, *Pondion leuccephala*, OSPREY. (See Note 3 below.)

p. 150, *Peltohyas australis*, Dotterel. This bird, the AUSTRALIAN DOTTEREL, does not visit Gippsland. The observation would apply to the Red-capped Dotterel (*Charadrius alexandrinus*), a resident at the Promontory but not listed by the writer.

9. Ref. *Vict. Nat.* 34: 121-127—"Notes of a Visit to Mallacoota Inlet", by Chas. Daley.

p. 127, "Flinders Pigeon" is evidently an error for "Flinders Cuckoo", now known as the KOEL (*Eudynamys orientalis*). This was recorded (by a specimen) from Mallacoota shortly before Daley's visit.

(On page 126, the writer sweepingly records for the area "all the smaller Warblers, Robins, Tits, Wrens, Flycatchers, Cuckoos, etc. . . ."; and his mention of the Bristle-bird would hardly be from observation, but rather on the strength of the report of the R.A.O.U. visit there in 1914.)

10. Ref. *Vict. Nat.* 44: 303-305—"Excursion to Sealers Cove", by Chas. Daley.

p. 305, "Skua Gull". This probably applies to immature Pacific Gulls (*Gibianus pacificus*) such as one usually sees accompanying adults of their species.

11. Ref. *Vict. Nat.* 58: 102-107—"Birds of Croajingolong", by N. A. Wakefield.

Both this and the following contribution were written before the writer had sufficient appreciation of the need for scientific accuracy and of the confusion which can result from the publication of unconfirmed data. It is necessary now to make these comments:

p. 103, GREEN-WINGED PIGEON. The recording of this bird (*Calophaps chrysochlora*) from the Genoa-Wangan River area must be rescinded. It was based on a doubtful sight record and on unconfirmed local report by a casual observer.

p. 104, LITTLE BITTERN. The reporting of this species (*Ixobrychus minutus*) referred to an unconfirmed local report. It could be authentic however, for the bird has been recorded from the Bega district some miles to the north (Ref. *Emu* 18: 303).

p. 105, PINK ROBIN. It is very doubtful that any bird seen was really this species. Of recent years the Rose Robin (*Petroica rosea*) has been observed many times in the areas concerned, but not the Pink (*P. rodinogaster*). Hence the original report should be disregarded.

p. 105, TASMANIAN MASKED OWL. Having recently examined museum specimens from Tasmania, the writer can now state that the bird caught at Genoa was a typical mainland Masked Owl (*Tyto novaehollandiae*).

(The reference, on page 105, to the Ground Parrot (*Psephotus walkeri*) as a "superb whistler" was also based on hearsay. In connection with this species, in a paper entitled "Down Marlo Way" (*Emu* 18: 265-272), the writers state that "of the numerous birds seen . . . not one uttered any call or note of any kind". This too has been the present writer's experience.)

12. Ref. *Vict. Nat.* 59: 70-72—"Bird Notes from Croajingolong", by N. A. Wakefield.

p. 70, PINK ROBIN. Again the birds referred to were almost certainly the Rose Robin.

p. 71, ROSE-CROWNED FRUIT-PIGEON. This is an error for the Red-crowned Fruit-pigeon (*Priliopis regius*).

p. 71, RED-CAPPED ROBIN. The photograph referred to appeared in *The Emu* 29, Plate 6, opp. p. 46, with the caption "Red-capped Robin—Mallacoota Inlet". The bird concerned is obviously the Scarlet Robin (*Petroica multicolor*), and the other is not authentically recorded for Gippsland.

13. Ref. *Vict. Nat.* 56: 113-114—"A Pardalote Puzzle", by Jean Galbraith.

p. 114, YELLOW-TAILED PARDALOTE. The description given is certainly not that of a Yellow-tailed Pardalote. It appears to be of an aberrant Spotted Pardalote (*Pardalotus punctatus*), in which the normal red area above the base of the tail is almost completely replaced by yellow.

14. Ref. *Vict. Nat.* 59: 49-54—"Sydenham Inlet in the Autumn", by M. L. Wigan.

p. 53, YELLOW-THROATED SCRUB-WREN. This is said to have been observed in the same habitat as that of the White-browed Scrub-wren (*Sericornis frontalis*), and it may be assumed that it was but a variation of the latter. (See Note 5 below.)

p. 53, BLACK-CHINNED HONEYEATER. Both this and the White-naped are recorded. (See Note 1 below.)

15. Ref. *Vict. Nat.* 51: "A Camera Interview with the Fairy Tern", by R. T. Littlejohns.

FAIRY TERN. Except for the introductory comments, the whole of this article deals with the Little Tern (*Sterna albifrons*). In particular, the two accompanying plates portray well the distinctive head markings of the latter species in its breeding plumage. (See Note 6 below.)

Note 1: If the Black-chinned Honeyeater is to be found anywhere in Gippsland, it should be in the drier, more open areas such as the Murray Pine districts of the upper Snowy River valley, not in the heavy forests. It has not been noted by the several competent observers who have investigated this country. However, there is a single sight record of the bird from north of Maffra—one specimen in a list which includes 15 White-naped Honeyeaters (*World Bird Day Lists*, 1953, p. 24—Suppl. to *B.O.C. Notes*, Melb.). It would be interesting to have this possible occurrence confirmed.

Note 2: The Brown Tree-creepers is restricted in Gippsland to the dry open forest areas: the upper Snowy River valley (including Suggan Buggan, Deddick and Wulgulmerang) and the Maffra-Bairnsdale district.

Note 3: There is no confirmed record of the Osprey for Victoria, and the species evidently should not have been included in J. A. Leach's *An Australian Bird Book*, which was intended to include only birds of this State. John Gould collected a specimen in southern Tasmania, apparently a solitary "stray" which was far from the normal habitat of the species.

Note 4: The Great Knot also should not have been included in *An Australian Bird Book*. Campbell's correction, cited above, escaped the notice of the compilers of the B.O.C. booklet *Field Guide to the Waders*, for they included for this species "specimen from Gippsland Lakes (Vic.), 1895".

Note 5: Of the Yellow-throated Scrub-wren, A. G. Campbell wrote (*Emu* 34: 263): "Its furthest south is Bulli, and while it is said to have been recorded in eastern Gippsland, no definite record of this occurrence can be found". Except that the species occurs somewhat south of Bulli, Campbell's

statement sums up the situation, and this bird should be deleted from Victorian lists.

Note 6: Of the two small terns, only the Fairy Tern (*S. nereis*) was known to occur in Victoria when *An Australian Bird Book* was first published. The Little Tern (*S. albifrons*) was recorded at Mallacoota by the R.A.O.U. Camp-out there in 1914 (Ref. *Emu* 14: 126-144). In Victoria, the Fairy Tern gauges east to the Wilsons Promontory area, while the Little Tern comes west as far as the Gippsland Lakes. It is not known whether the two ever overlap in Gippsland.

It is the intention of the present writer to deal with further erroneous bird records, in papers in this journal and in *The Emu*, and to discuss more fully some of the statements outlined in the above notes.

MICROSCOPICAL GROUP REPORT

On Wednesday, November 20 last, Mr. C. Middleton gave a talk entitled "Colour" in which the colours of the spectrum were demonstrated on the screen with the aid of a spectroscope. He also exhibited three lanterns fitted with lenses and filters to show the effects of producing complementary colours and for mixing them by projection. There was a large number of interesting specimens under the microscopes such as butterfly scales, silver crystals, transverse and longitudinal sections of *Echinus* spines, elytra of a Diamond Beetle, chemically produced iridescent crystals, and spicules of *Gorgonia*.

The programme committee of the Group met on Wednesday, November 27, and drew up a tentative programme of subjects for the coming year. During January and February, when pond-life is most prolific, Mr. D. McInnes will speak on "Protozoans" during January (see below), and it is hoped that an expert on the Rotifer will speak during February.

WHAT, WHERE, AND WHEN

F.N.C.V. Excursions:

Sunday, January 19—Parlour-coach excursion to Point Lonsdale. Leader: Mr. E. H. Coghill. Local members may join party at Eastern Beach, Geelong, at approximately 10.30 a.m., or at Marcus State School at about 11.30 a.m. Coach leaves Batman Avenue at 9 a.m. Fare, 18/- for Melbourne members. Bring two meals. Bookings with Excursion Secretary.

Saturday, January 25—Botany Group excursion to Footscray Gardens. Leaders: Miss Baafan and Mrs. Pinches. Meet 2.30 p.m. at main gate of the gardens, Ballarat Road, Footscray.

Sunday, February 9—Geology Group excursion. Details will be given at the Group meeting.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated.)

Wednesday, January 15—Microscopical Group. Subject: Protozoans. Speaker: Mr. D. McInnes.

Monday, February 3—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms at Parliament House at 8 p.m. Enter through private gate at south end of Parliament House.

Wednesday, February 5—Geology Group.

—MARIE ALLENDER, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7.

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PROCEEDINGS

GENERAL MEETING, DECEMBER 9, 1957

About 120 members and friends attended the Monthly General Meeting chaired by Mr. J. Ros Garnet who extended a welcome to Mr. Tarlton Rayment after his long illness. He also welcomed Mr. J. M. Landy from Timbertop.

Mr. Landy spoke on the school at Timbertop. It is a branch of Geelong Grammar School and is situated at the foot of Mt. Timbertop, near Mansfield. Mr. Landy pointed out that one of the aims of the school was to give the boys training in fending for themselves and to give them a chance of leading a healthy out-of-doors life for part of the time. Members noted with interest that sporting activities were almost completely replaced with other activities such as hiking, cutting firewood for winter, and caring for the grounds immediately surrounding the school. They apparently had to do nearly everything for themselves, except mending and cooking. A normal school curriculum is followed and the results obtained so far have proved very satisfactory. During the week-ends, nearly all boys hike through the nearby hills, but Mr. Landy pointed out that at the beginning of the school year the areas around Timbertop were zoned for two main reasons. First, they were not permitted to go beyond a certain distance for fear that some students might become lost—they had to learn their way through the nearby countryside before they were allowed to go further away; and secondly, they must be conditioned to hard hiking before any long journeys were undertaken. During the whole time students were at Timbertop, no one was truly lost, though occasionally a few boys arrived back at the school a few hours late. One activity which many of the students enjoyed was photography and many excellent colour slides were shown during the evening's meeting. Some of the photographs were of very high standard and showed that the boys had much patience and ability. All members present at the meeting agreed that the Geelong Grammar School is to be highly commended for making it possible for their students to enjoy some of the many

facets of nature. After ably answering several questions, Mr. Landy was thanked for a most interesting and informative lecture.

Several matters were brought before the notice of members by the President and Secretary. Another appeal was made for helpers for the Moomba Nature Show (please refer to *The Victorian Naturalist* for January 1958, page 126). This matter is important. The final financial result of the Prahran Nature Show held last October indicated a profit of nearly twenty-two pounds, due mainly to the kindness of the Prahran Town Hall authorities. Members were also informed that the Library Committee was now in the formative stage and that only one more member was needed. The Lorne League of Bushlovers was affiliated with the F.N.C.V. on the motion of Mr. Coghill and seconding by Mr. Curtis.

The following members were elected to the Club: Mrs. I. C. Harding, Hawthorn (Ordinary Member); Mr. T. Connors, Kororoit (Country); Mr. P. E. Finek, Heathcote (Country). The Rev. A. J. Maher of Berwick was elected to Honorary Membership.

Amongst the exhibits at the meeting were Land Shells, *Succinum australis* Ferussac and *Pupoides adelaidae* Ad. & Ang. (Mr. Sarovich and Mr. Gabriel); fasciation in Flatweed, *Hypochaeris radicata* (Mr. Wakefield); Yacca Gum from *Xanthorrhoea australis*, demonstrating its solubility in alcohol (Mr. Garnet); shells, *Phasianella australis* and *Bullaria botanica*, from deposits several thousand years old at Point Lonsdale (Mr. Coghill); garden-grown native plants, including an interesting *Callistemon* (Mr. Brookes).

GENERAL MEETING, JANUARY 13, 1958

Mr. J. Ros Garnet extended a welcome to Mr. and Mrs. Stan Colliver who came south from Brisbane for a short stay in Melbourne. The President referred with considerable feeling to the death of Mrs. J. W. H. Strong, wife of a prominent member of our Club. He also announced that Dr. Chattaway's mother had reached 94 years of age. It was also announced that the Australian Natural History Medallion had been awarded to Mr. Bryant who has been editing *The Emu* for a considerable time.

There were three speakers for the evening: Miss Woollard, Mr. Coghill, and Mr. Colliver.

Miss Woollard illustrated an interesting talk on parts of Western Australia by a series of colour slides. Among these were *Caladenia flava*, *Andersonia* spp., *Petrophila* sp., and *Banksia coccinea*. Many other slides were shown and species of the families Proteaceae and Epacridaceae seemed to predominate. Several photographs of the district around Albany were also shown.

Mr. Coghill gave a very short talk on the recent F.N.C.V. excursion to East Gippsland.* He said that some thirty members and

friends attended the excursion to the area. A feature of the trip was a visit to the Goolwin Sands by two separate parties of members. He also mentioned that some Funnel-web Spiders were noted.

Mr. Colliver began his lecturette by expressing his pleasure at being back at a F.N.C.V. meeting and brought greetings from the Queensland Field Naturalists Club. This Club has yearly camp-outs at the sea-side or in the bush, alternating them. Mr. Colliver began his series of colour slides by illustrating the Queensland University and the Botanic Gardens. The well-known *Bougainvillea* is a very promiscuous plant in Queensland and the speaker mentioned in passing that one gentleman at Indooroopilly was growing about twenty kinds of this beautiful plant. Some other interesting slides showed parts of the Brisbane River and several well known beaches. One of the outstanding features illustrated during the talk was the famous Glasshouse Mountains. These consisted of tall and almost inaccessible pinnacles which are really the massive cores of extinct volcanoes. At one private sanctuary, bread soaked in a mixture of honey and water is fed daily to hundreds (sometimes thousands) of lorikeets at 4 p.m. The birds seemed to know the feeding time and apparently are not afraid of humans. Mr. Colliver commented on the performance of the Bottle-nosed Grampus (commonly called Porpoise) at Point Danger, near Burleigh. Other slides were taken from Mr. David Fleay's Sanctuary which is in the same district. Mr. Fleay demonstrated the sluggishness of the "ferocious" Taipan and the speed at which the Common Brown Snake can move. It was stated that the basalts at Cunningham's Gap were rich in zeolites and that other fossils had been found in the same area. Other interesting features of the talk were the red loams near Childers and the organ pipe-like rocks of algal origin at Paradise Creek. The true origin of the former are not known and they have been called Red Soil Residuals by Professor Bryan of the Queensland University. Mr. Colliver also commented that one of the "organ-pipes" had been traced for about 400 feet, thus demonstrating its great age. He finished off his interesting and informative talk with several colour slides of some crater lakes on the Atherton Tableland and notes on slugs, snails, and the Pitta which is a bird that surrounds its nest with large numbers of snail shells.

Among the exhibits for the evening were *Crocea* (Mr. Garnet); the New South Wales Christmas Bush (Mr. Lewis); Kangaroo Paw (Miss Raff); fasciated *Pultenaea gunnii* (Mr. Webb); eucalypt leaves showing insect galls (Mr. Coghill); *Crocea erubescens* grown under garden conditions (Mr. Brookes).

* A comprehensive report of this excursion will be given later in a subsequent issue of *The Victorian Naturalist*.

EMBEDDING OF BIOLOGICAL SPECIMENS IN PLASTICS

By A. STEN*

During the past several months I have been carrying out a series of experiments in the embedding of specimens in locally produced Australian plastics. Though these experiments are not yet complete, the results obtained are encouraging inasmuch as they show in practice that the suitability of some Australian plastics for embedding biological specimens is in no way inferior to that of plastics produced in overseas countries. The embedding of specimens in such material is in great favour in many places, especially in England and U.S.A. Numerous references in literature dealing with embedding procedure have been published and a number of patents relating to this process have been granted abroad already.

Among plastics manufactured in Australia one should name methyl methacrylate—the first synthetic resin used as an embedding medium. It was first marketed in the U.S.A. in transparent sheet form in 1936, and as modelling powder in 1937. It is a derivative of acrylic acid. At present methyl methacrylate is widely used in the plastic industry and by almost all scientific bodies dealing with the embedding of biological specimens. It is considered as the best from the standpoint of brilliance, clarity and permanence of the completed mounts. Polylite 8005 is another plastic which shows very promising results and belongs to the group of polylite resins which are liquid, thermosetting in nature, and convertible into solid transparent blocks even at room temperature by the addition of catalysts. Polylite resins are heat, corrosion, water and weather resistant, light in weight, and of great strength. Besides these properties polylite 8005 also shows high transparency and good colour, rapid release of bubbles, and excellent solubility in ketones, esters and some chlorinated hydrocarbons. Uncatalysed stability of this plastic is as long as six months. All these properties make polylite 8005 an ideal medium for embedding certain kinds of biological specimens.

My experiments with these plastics were limited to embedding of botanical material (with previous preservation of natural colours) and also insects, shells and bones. The embedding technique employed during this work is outlined in the following pages.

I am indebted to Mr. Robert Boswell, the head of the Department of Preparation in the National Museum of Victoria, for the accompanying photographs and for the moral support he gave me, without which my experiments would not have been successful.

* Assistant Preparator, National Museum of Victoria.

PREPARATION OF SPECIMENS FOR EMBEDDING FLOWERS AND LEAVES

Flowers and leaves should be treated in special solutions to preserve their natural colours. The following three basic solutions were used in the experiment.

RP-SOLUTION (Red and Pink Flowers)

This solution consists of 100 parts by weight of tertiary butyl alcohol (C_4H_9OH), one part of thiourea (NH_2CSNH_2) and two parts of citric acid ($C_6H_8O_7$). Experience shows also that the weight proportions are not final and can be varied with the same results.

BG-SOLUTION (Blue and Green Material)

This is prepared from tertiary butyl alcohol, thiourea and sodium citrate ($Na_3C_6H_5O_7$) in the same weight proportions as for the RP-Solution, viz., 100 : 1 : 2.

INTER-SOLUTION (Intermediate Solution)

For satisfactory preservation of intermediate colours, the same four compounds should be mixed: two parts of thiourea, two parts of sodium citrate, two parts of citric acid and 200 parts of tertiary butyl alcohol by weight.

Solutions keep better in labelled glass jars. Flowers and leaves are placed in the jars so that they are completely covered with the solution and left for 10 to 24 hours, depending on the nature of the material. The temperature should not be below 20°C., but it should not be very high, since some colours are inevitably lost in boiling solutions. After the material is preserved, it should be removed from the solutions and dried in an oven at a temperature of approximately 50°C.

BONES, SHELLS, AND INSECTS

Before bones are treated, they should be completely degreased, bleached, and dried. After drying they should be placed in a jar, covered with liquid plastic, and treated in a vacuum desiccator to remove all air bubbles and allow the plastic to penetrate. If a vacuum desiccator is not available, special attention must be given to removing air bubbles. It is necessary to keep shell specimens in plastic for a while to fill the inside of them before the curing process is commenced. Insects may be treated in a similar manner.

If methyl methacrylate is used as a medium, the best cells for embedding purposes are glass vessels which are broken after the process of curing is completed, but the hard blocks of polylite 8005 could be easily separated from the cells if this is used.

PLATE IX



EMBEDDING OF SPECIMENS IN METHYL METHACRYLATE

The basic materials and equipment for this process are as follows:

1. Methyl methacrylate (Monomer) or "Kallodoc Solution".
2. Acrylic granules.
3. Caustic soda solution (NaOH).
4. Anhydrous calcium chloride (CaCl₂).
5. Blocks of acrylic perspex sheets.
6. Litmus paper.
7. Glass funnel.
8. Vacuum desiccator.
9. Glass cups.
10. Electric oven.
11. Polishing equipment.

The "Kallodoc Solution" contains a stabilizer which should be removed by washing with 5 per cent caustic soda solution in a funnel until it is no longer alkaline. The monomer separates into two layers, a clear upper layer over a brown liquid which is removed from the funnel. The washed residue is then collected in a glass container and some anhydrous calcium chloride added to dry it. After 24 hours it is ready for the curing procedure. For some work it is desirable to reduce the solution to the consistency of syrup by adding some acrylic granules or small pieces of perspex. This causes faster setting but it is harder to avoid air bubbles. After the specimen is dehydrated and treated in the vacuum desiccator, it is transferred to a suitably-sized glass dish, where the curing process is carried out. A circle or square plate of perspex which is cut out to fit the bottom of the dish is a good base for the specimen. If polymerization is to be done layer by layer, the specimen is placed on the perspex base in the dish, a thin layer of methyl methacrylate syrup is poured in and the whole is put into the oven. During the process of curing, air bubbles appearing should be removed with a long needle. To avoid evaporation, the dish should be covered with a lid. When polymerization is completed and the top layer is dry, the dish is removed from the oven, allowed to cool, and the glass is broken. The released block is then levelled with sand-paper and polished. One of the serious disadvantages of this plastic is a disagreeable smell spread by the monomer which irritates the eyes.

EMBEDDING OF SPECIMENS IN POLYLITE 8005

The following materials and apparatus are necessary for embedding:

1. Polylite plastic 8005.
2. Catalyst No. 2.
3. Glass vessels.
4. Vacuum desiccator.
5. Electric oven
6. Glass jars.

Polylite 8005 in the measured quantity necessary to fill the glass dish is mixed with catalyst (2-5 per cent) and stirred in a separate glass container. Then it is allowed to stand for 20 minutes to complete the catalysis. The catalyzed polylite plastic is poured into the glass dish to cover approximately a quarter of the volume of the dish which is then placed in the oven at a temperature of 45°C. for about 2 hours. The remaining polylite will not solidify at room temperature for at least 10 hours. Then the dish is removed from the oven and the specimen from the vacuum desiccator is fixed to the plastic base. Then a thin layer of plastic is poured into the dish which is placed in the oven again until the plastic dries. The dish is three-quarters filled with polylite plastic and the plastic dries in the oven. The final layer of plastic is applied and the dish is again placed in the oven until it dries. It is then removed and allowed to cool. The block can be easily separated from the dish by placing the blade of a knife between the walls of the plastic block and the dish. The block, with the specimen now inside it, should be levelled with sand-paper and polished.

The results obtained with polylite 8005 are satisfactory. The whole process of embedding is quite simple and can be completed in 12-24 hours depending on temperature and the percentage of catalyst used in the process. This plastic is good for embedding both hard and soft subjects, but my experiments with embedding soft subjects in polylites are not yet completed. The main difficulty faced at present is the preservation of natural colours which the process destroys in soft sections such a heart, kidney, stomach, etc.

Plate IX. (p. 144) illustrates examples of biological specimens embedded in plastics.

Generally speaking, embedding of biological specimens in Australian produced plastics is a new field of activity which will no doubt find wide application in the near future, especially for educational purposes. Fragile specimens such as subjects of general and applied entomology, samples of seeds, examples of mimicry and species which are easily confused such as centipedes and millepedes, and anatomical specimens could be placed in plastic blocks and used with great value in schools, colleges and universities.

VICTORIA'S LADY WILDFLOWER-ARTIST**(Amy Vardy Fuller, 1869-1944)**

By J. H. WILLIS

Western Australia had its Emily Pelloe and visiting Marianne North; South Australia its Rosa Fiveash; Tasmania, Louisa Meredith, and various States (as well as New Guinea) shared Mrs. Ellis Rowan. Among the most valued assets of the Field Naturalists Club of Victoria are 230 water-colour studies of native Australian and South African flowers by the late Miss Amy Fuller, who died in August 1944 and whose work testifies to her reputation as a great, if not the première, Victorian wildflower-painter. These pictures were bequeathed to the Club in her will, were immediately insured for £200, and are now housed for safe keeping at the National Herbarium of Victoria. Selections of them have been exhibited at practically every nature show organized by the F.N.C.V. and, even before the donor's death, they were a familiar feature of annual displays.

The Club owes a debt of gratitude to Miss Molly Elder and John Béchervaise who, in 1954, carefully mounted all the paintings on strong white cardboard—a very desirable, if onerous, undertaking—and their attached linen flaps now enable the separate pictures to be pinned for future exhibitions without damage to the corners (which unfortunately happened to some of them in former days). Although Amy Fuller needs no better memorial than her own delightful handiwork, some account of her life and accomplishments is long overdue. The following biographical notes are presented in an attempt to satisfy this need, and for many details the writer is indebted to Mrs. V. H. Perry of Canterbury (daughter of Miss Fuller's elder brother, Arthur).

Born at Geelong in 1869, Amy was the youngest among four daughters and second-youngest child of John Hobson Fuller who had migrated from England, first to South Africa and subsequently to Geelong in Victoria where he practised as an accountant. Her two brothers followed the paternal business lead, the elder (Arthur John) founding the Melbourne accountancy firm of Fuller King & Co., the younger (Robert Arnold) settling in New Zealand; all six children have now passed on. The girls had unusual artistic ability. Florence, who never married, was a talented oil-painter: she spent seven years in Europe (1893-1900), studied under British and French tutors and saw her work exhibited both at the London Academy and Paris Salon. In South Africa Cecil Rhodes gave her portrait sittings, while her delicate Australian scenes are represented in the public galleries of the six States [see article on Florence Fuller in *A.A.I.* for September 1st, 1904, p. 595—where she

is described as "one of our best artists"]. Another sister was Mrs. C. C. Lance, wife of the New South Wales Commercial Agent in London; her rich contralto voice gave pleasure to many audiences, and she took solo parts in Handel's *Messiah* with Sydney Philharmonic Society, as well as playing the piano skilfully and very sweetly. The third sister, Mrs. F. W. Parsons, at one time instructed students of art.

Amy received her education at the Presbyterian Ladies' College, Melbourne, was a very keen sportswoman and later played A grade tennis. Incidentally, a niece (Sylvia Lance, now Mrs. Harper of Sydney) won the Women's National Tennis Championship of Australia, and she was chosen by the L.T.A.A. to captain an Australian group of women tennis players visiting Western Europe and America in 1925; this team scored notable victories throughout Britain, in France and Belgium.



The late Miss Amy V. Fuller.

Photo by courtesy Miss Gwen Neighbour. Melbourne Liedertafel. By 1894 she had sung on concert platforms in Perth and South Africa; thereafter she taught singing both in Melbourne and Western Australia, where resident for a number of years. Even as late as 1913 this gifted lady took some advanced singing lessons herself from Madam Minna Fischer in England, and there she met many musical celebrities—notably Ada Crossley, Liza Lehmann, Amy Woodford Findon, Madam Christian and Conningsby Clark. In more leisured hours Amy played cards with great enthusiasm and, at one time, gave lessons in bridge. As an early member of the Arts and Crafts Society in Melbourne, she was among the first exponents of poker-work and painting-on-wood; she decorated innumerable boxes, murals, etc., and her designs in all these projects were dominated by native trees and blossoms. From time to time she held exhibitions of her handicraft. An old friend has described her hands as "very tiny and pretty and always busy".

But it is for her water-colours of the flora that Miss Fuller enjoys a lasting reputation with the Field Naturalists Club of Victoria. She was elected to membership in September 1914 and, at

the Club meeting of June 14th, 1915, read a fascinating paper ("Some South African Scenes and Flowers") which was published in *The Victorian Naturalist* two months later (Vol. 32, pp. 57-64). Herein she writes:

It was only my love of flowers that prompted me to find a way to preserve the memory of the thousands of native flowers that came under my notice whilst I was living in Cape Town with my relatives.

With modest restraint, the fact is not mentioned that she stayed there with her uncle, Sir Thomas Fuller who was then Agent-General, and that on many occasions she met Cecil Rhodes. An enthralling account of her week spent on the Zambezi River, Rhodesia (at and near the majestic Victoria Falls) occupies four pages: one can see the fresh green fairyland of palms, ferns, tropical trees and moss-covered boulders (all encircled by perpetual rainbows from the play of sunlight on drifting spray), titanic baobab trees resplendent with large hibiscus-like blooms and hung with cucumber-shaped fruits to 18 inches long, hippopotamuses cavorting in the river shallows, lurking crocodiles and, as a grand climax, the tremendous yawning chasm of the Falls itself—where any visitor can only gaze and gaze "in speechless amazement", while the fine spray rises "like white smoke of some huge bush-fire". That was in 1893 or 1894 during her first 18-months' sojourn in Africa, which she was to revisit in 1898 en route to England; two further periods were spent amid the wonders of the Cape flora, the last in 1913-14; and Miss Fuller reported having painted "about 325 South African specimens, which the late Prof. MacOwan named for me, also 165 West Australian flowers which were named by the late Dr. Morrison" (a total of 490). She then commenced the portrayal of Victorian and New South Wales kinds.

During her London visit of 1914, the authorities at the Royal Botanic Gardens expressed a desire to purchase part of the floral paintings for Kew Herbarium, "choosing the flowers that were most uncommon, and of which they had no representations other than pressed specimens". Thus, wrote Amy, "it was with a heavy heart that I parted with the 102 sheets which they selected, as my flowers have always been very dear to me". The present writer can find no mention of this purchase in any available report on the acquisitions of Kew, and it would be interesting to know the true position with regard to these 102 delineations. Together with the 230 now held by the F.N.C.V., these make up only 332—what has happened to the remaining 158 (at least), which the artist claimed to have painted?

A note in *The Victorian Naturalist* [33: 97] compliments Miss Amy Fuller for having organized the instrumental and vocal music at the Club's big Wildflower Show in Melbourne Town Hall on October 3rd, 1916. Her name is on the published membership list

for 1920, but not on the 1932 or 1940 lists: so, sometime in the 1920's she would seem to have dropped out of Club activities and allowed her membership to lapse. At the time of her election Miss Fuller resided at Canterbury (Stanley Grove), later she lived at Hawthorn (Berkeley Street) and finally at Kew (Princess Street). She died suddenly in Melbourne from a heart seizure on August 18th, 1944, and her remains were cremated at Springvale three days later. So passed away one of the most versatile, vivacious and charming gentlewomen the Club has been privileged to number among its ranks.

BOTANICAL BOOK REVIEWS

By J. H. WILLIS

1. How to Know West Australian Wildflowers. Part II.

W. E. BLACKALL & B. J. GRIEVE [University of Western Australia Press, Nedlands, Jan. 1957. 8^{1/2}" x 5". 198 pages. 4 plates in colour. Price 30/-.]

It is more than three years since the first part of Dr. W. E. Blackall's handbook was accorded brief mention in *The Victorian Naturalist* [71: 100 (Oct. 1954)]. In the interim there has been a steady demand for this popular pictorial work, and the publication of Part II (early in 1957) is most gratifying. Now the book appears under joint authorship, for the simple reason that Dr. Brian Grieve has done the lion's share of work for the new part. He was confronted by a number of handwritten, unscripted and incomplete manuscripts for which he brought many of the keys to completion, constructed entirely fresh ones and provided drawings of much greater detail—showing a branchlet or leafy shoot with flowers, as well as the individual organs of diagnostic value. Although the ground work and general format of the original Blackall mss. remain the same, the chief body-detail results from enthusiastic effort on the part of Dr. Grieve. Much credit is also due to Miss Joan Rayner who scripted the final copy and reproduced the hundreds of illustrations, and to Mrs. K. Holland who undertook the final organization (typing and checking of indices, etc.).

A pleasing addition to the Index of Scientific Names is a locality column indicating, for each species, the botanical districts in which plants are known to occur—viz. Irwin, Austin, Avon, Coolgardie, Darling, Warren, Stirling and Eyre. Page numbers run on serially from p. 321 of the last key (to *Eucalyptus*) in Part I, continuing as far as p. 459. Thus, the new part is less than half the size of its predecessor; but it embraces 480 species in such large and puzzling genera as *Hibbertia* (63), *Pimelea* (32), *Dodonaea* (26) and *Franckenia* (23), the entire families *Rhamnaceae*, *Malvaceae* and *Stereulaceae*. All major groups of vascular plants up to and including the *Myrtaceae* (by Engler and Prantl's arrangement) have now been treated; Part II also incorporates the 165 species of temperate West Australian *Goodeniaceae* so that students may have, without further delay, a ready guide to the colourful and unusually interesting members of this typically Australian family—the dust jacket very attractively features a display of Blue Leschenaultia (*L. biloba*). Only the groups *Onagraceae* to *Compositae* remain, and these, presumably, will constitute a final and rather larger Part III of the series.

No praise can be too lavish for this highly successful attempt—the first of its kind in Australia—to present a large, very complex, regional flora (of

some 4,000 species) in simple language and by means of clear, unambiguous line-drawings for each species. The accessory key to plant families, explanatory notes, glossary and two indices are admirably set out and remarkably free from typographical slips. With a strong board-binding, and final dozen blank pages for notes, the present volume—still moderately priced at 30/-—may be taken conveniently on field excursions, and its rôle as an indispensable tool-of-trade for practising botanists in the West is assured. Growers of the spectacular south-western flora in eastern States, and in New Zealand, will also be glad to avail themselves of such a handy, workable key to identities. "How to Know" ranks worthily with the best among Australia's growing output of useful botanical literature.

2. The Toxic Plants of Western Australia

C. A. GARDNER & H. W. BENNETTS [West Australian News papers Ltd., Perth, Aug. 1956. 9 $\frac{1}{2}$ " x 7 $\frac{1}{2}$ ", 253 pages, 52 plates in colour, 45 ink-drawings. Price 50/-]

Systematic botany, as a purely detached and academic study, is of interest to very few Australians indeed; but when it can be brought to bear directly on some phase of the country's primary productivity—our "bread-and-butter" supply—, both the interest and importance are heightened immensely. In tropical as well as temperate parts of Western Australia, substantial losses of grazing animals (sheep, cattle, horses and goats) have been ascribed to the ingestion of native plants that were variously toxic. From the days of early settlement "Yack Road poison" was a problem to stockmen, and other suspected plants (Champion Bay poison, Candyup poison, etc.) took their popular names from those districts where trouble occurred. The West seems to be endowed, or cursed, with a far greater variety of poisonous wildflowers than any other large part of the Commonwealth. Obviously, an authoritative guide to these vegetable offenders is de rigueur.

There have been occasional descriptive articles and brochures involving some of the proven poisoners; but time was ripe for a really comprehensive work. That need has now been supplied in *The Toxic Plants of Western Australia*—by the fortunate collaboration of Mr. C. A. Gardner (Government Botanist) and Dr. H. W. Bennetts (Principal of the Animal Health and Nutrition Laboratory, Perth). They have produced an excellent book covering all the known species of poison plants throughout the whole State, both indigenous and naturalized. The binding, very strong paper, bold format and choice of the type leave little to be desired. Species are arranged systematically (Engler and Prantl scheme) in family groups, which are simply defined; and, for each of the 127 species discussed in detail, there is a good description—understandable to the non-technical man—with an account of its toxicity (signs, symptoms, effect on animal organs, etc.). As announced by the blurb on the dust-jacket, the work "enables pastoralists and farmers to recognize symptoms of poisoning and suggests means by which eradication of toxic plants may be effected". Many other suspected plants are mentioned under their respective groupings. Keys are provided to distinguish certain species in difficult genera, e.g. *Isotropis* and *Datura*, the combined key for *Oxylobium*—*Gastrolobium* (attractive but deadly leguminous shrubs) embracing 32 species.

A very pleasing feature of this book is the variety of splendid portraits—much more accurate and artistic than most that have hitherto accompanied publications on the poison plants or weeds of the Commonwealth. The 45 full-page ink drawings uphold a high standard of botanical illustration that one has come to expect of Mr. Gardner, while the 37 reproductions in colour from water-colours by Edgar Dell are a delight. The latter had already appeared in a small booklet entitled *Poison Plants of South-western Australia*.

published by West Australian Newspapers Ltd. in 1937, and to these Mr. Gardner has added 15 of his own superb paintings. For a mine of information on this extremely important but fascinating subject, and for such a wealth of pictorial art, the cost of £2/10/- is moderate among present book prices.

3. Forest Trees of Australia

FORESTRY AND TIMBER BUREAU, Department of the Interior
[Commonwealth Government Printer, Canberra, Aug. 1957. 9*1*/₂" x 6*1*/₂".
230 pages. 11 plates in colour, 91 half-tone plates, Price 42/-.]

For all its comparative youth and sparse population, the Commonwealth is certainly not numerically deficient in tree books. R. H. Anderson's *Trees of New South Wales* (2nd edition 1957) and D. D. Francis's *Australian Rain Forest Trees* being two publications of outstanding merit. Then there have been older works, e.g. Baker and Smith's elaborate *Pines of Australia* (1910), devoted to particular sections of the arboreal flora; but a handy guide to all the commercial timber-producing species has long been a desideratum. Our Federal Forestry and Timber Bureau has risen to the occasion, and, through the united efforts of an enthusiastic team (particularly Messrs. N. Hall, R. D. Johnston and C. D. Hamilton of Canberra), we now have a piece of compact botanical literature—*Forest Trees of Australia*—which any technical library, practising forester or general phytologist would be proud to own.

Although the book lays no claim to comprehensiveness, never before have so many Australian tree-species been presented in comparable detail. Two pages of information accompany each of the 82 species chosen, 67 being eucalypts, i.e. as emphasized by Director-General G. J. Rodger in his brief preface "Eucalypt forest covers nearly 95 per cent of the forested land of Australia, consequently most of the trees described and illustrated in this book belong to this typically Australian genus."

Species of *Eucalyptus* have been arranged according to Blakely's standard *Key to the Eucalypts* (1934). On each left-hand (even-numbered) page is a very full description of the tree, neatly summarized under the headings of bark, leaves, inflorescence, fruit and wood, with notes on size, form and habitat, accompanied by a lucid inset line-map of Australia to show distribution (in heavy black). The common name is the main heading (in bold capital type), with its accepted botanical equivalent italicized in the right-hand corner. The opposite or right-hand page is devoted entirely to illustrative detail: *in situ* photographs to portray the habit of the tree, a close up of its bark, juvenile and mature foliage to scale, buds and fruits (or cones in the case of conifers) also to scale. These pictures are really good, that of White Sallee (or Snow Gum) on page 145 being a camera-man's dream. Then, at the beginning of the book, there are eleven full-page reproductions of colour-photographs depicting eucalypts in distinctive forest formation. The West Australian shots (of karri, wandoo and salmon gum) are vividly faithful; but, for some reason, the colour register of eastern species—especially rose gum and pink bloodwood on page 19—is defective, the subjects looking unnaturally bleached and ghostly.

In general, the divers tropical and cabinet-wood trees, such as *Gastanothecium*, *Cedrela*, *Cryptocarya*, *Diospyros*, *Flacouria* and *Flindersia* species, are excluded because they were already so well covered in *Australian Rain Forest Trees* by Francis. A map of Australia, tinted to show commercial forest regions with 10-inch isohyets (up to the 40-inch zones), a glossary of technical terms and general index serve to complete this excellent handbook which is printed on glossy art paper between strong board covers of black cloth boldly lettered in silver.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

LITTLE WATTLE-BIRD VERSUS TIGER SNAKE

While in South Gippsland during the Christmas-New Year holidays, I witnessed a most interesting and unusual encounter between a 3-ft. Tiger Snake and a Little Wattle-bird. The local land-owners to whom I described the event, said that in all their years of experience they had never seen any inclination on the part of Wattle-birds to declare war on snakes though they all agreed that these birds, to say the least of it, were very pugnacious. One farmer—a keen observer and an excellent shot—stated that he had secured many a good fox-pelt in the past by noting the behaviour of Wattle-birds, a few of which would at times take particular delight in "buzzing" Reynard until their unwelcome tactics forced the animal to break from cover.

I left "The Shack" one perfect summer's morning to collect our daily ration of milk and cream from the nearest farm-house, leaving my wife sitting in the sun writing letters. On my return some time later she breathlessly announced, "There's a snake in the wood-heap and a bird mounting guard!" To my inquiry as to whether or not the bird was a Kookaburra she answered in the negative.

While busy with her correspondence, she was startled to hear a loud flapping of wings close at hand. Looking up she saw within a few feet of where she was seated a snake being "dive-bombed" by a bird! She gave me a vivid description of the scene with the snake making only slow progress towards cover. It had apparently wasted precious time and energy attempting to strike upwards at its fast-flying opponent. Our wood-heap was at the butt of an old honeysuckle tree and was the usual conglomeration of back logs for the open fire-place, tea-tree roots, split wood, bits of fruit-cases for kindling, etc. To my surprise, on a low branch, with a bird's-eye view of the situation, was a Little Wattle-bird.

Armed with a stout stick, I vigorously and as I imagined thoroughly prodded and poked at the heap of wood without seeing any sign of our unwanted visitor, and I naturally concluded that it had disappeared into the scrub along the bank of the creek some yards distant. But still our "guardian angel" (to quote my wife's expression) sat on a hough in a strategic position silently regarding my futile efforts.

Calling to mind the old rhyme about "A wise old owl lived in an oak", though in this instance it happened to be "a wattle-bird in a Banksia", I decided to trust the bird's judgment, rather than my own, and accordingly retired indoors to keep a watchful eye on events through a convenient window. For considerably more than half an hour by my watch our feathered friend painstakingly examined the wood-heap from every suitable perch and from every conceivable angle, occasionally flying down and literally peering into all the holes and crevices between the various pieces of wood. One could not help but marvel at the bird's vigilance and patience. As the minutes ticked by, the betting shortened to odds-on that "the Tiger" was still, at least, a temporary inhabitant of our wood-pile.

Eventually, however, it emerged and the second round of the contest commenced. Down swept "the fighter" in a power-dive to renew hostilities. So I sallied forth, stick in hand to render any help necessary. That snake certainly deserved some sympathy. It could make little or no head-way towards the creek-bed and safety and was obviously on the defensive with its neck and the greater part of its body flattened out. At times it attempted to counter-attack but the furious onslaughts from the air were being conducted at too fast a tempo for its comfort, and the almost constant belting the reptile was receiving from the bird's wings must have made it feel very weary indeed.

One quick blow behind the head was all that was necessary to terminate the battle. In the language of the classics it was "a sitting shot".

But still our bodyguard was far from satisfied. For some considerable time that bird surveyed the dead snake with its head first on one side and then on the other, occasionally swooping low over the corpse to ascertain whether there was any more fight left in it.

As wattle-birds are brush-tongued honeyeaters and nest above ground-level, why all the commotion?

—R. M. WISNART.

MICROSCOPICAL GROUP

The attention of all members of the F.N.C.V. is drawn to the next meeting of the above Group, to be held at the National Herbarium at 8 p.m. on Wednesday, February 19, when the guest speaker will be Dr. Maxwell Clark, the eminent geneticist of the University of Melbourne and whose research work is well known. His subject will be "Radiation Genetics". Please make this meeting worth while by your personal attendance.

Mr. D. McInnes was the lecturer at the last meeting. With the aid of about sixteen microscopes on the bench, those present were invited to search for the "Protozoons" in samples of pond water. This novel approach gave each person an opportunity of identifying at least one specimen among this large group which includes the flagellates, *Amoeba*, ciliates, *Paramecium*, etc.

WHAT, WHERE AND WHEN

F.N.C.V. Excursion:

Saturday, February 15—Excursion to the Botanic Gardens. Subject: Pond-life. Leader: Mr. D. McInnes. Meet in front of the kiosk at 2 p.m.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated.)

Friday, February 14—Botany Group. This Group will resume meetings at the National Herbarium this year, and each meeting will be preceded by a short talk dealing with botany for beginners commencing at 7.45 p.m. The first speaker will be Mr. Swaby, and he will be followed by Mr. Atkins who is to deliver an illustrated lecture on "Heathlands" later in the evening. New members are cordially invited to attend.

Wednesday, February 19—Microscopical Group. Subject: Radiation Genetics. Speaker: Dr. Clark (lecturer in Zoology at the University of Melbourne). All members of the Club are invited to attend this meeting.

Monday, March 3—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms in Parliament House at 8 p.m. Enter through private entrance at south end of Parliament House.

Wednesday, March 5—Geology Group. Members' Night. Subject: Geology Holiday Experiences.

Preliminary Notice:

Sunday, March 16—Combined excursion with the Bendigo F.N.C. to Barfold and the Mitchell Falls. Leader: Mr. F. Robbins. The parlour-coach will leave Batman Avenue at 9 a.m. Fare, 19/- Bring two meals. Booking with Excursion Secretary.

MARIE ALLENBROOK, Excursion Secretary
19 Hawthorn Avenue, Caulfield, S.E.7

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PROCEEDINGS

About 140 members and friends attended the General Meeting at the National Herbarium on February 10, 1958. Amongst visitors welcomed to the meeting was Miss Anita Bogild from Denmark.

The main item of the evening was an informative address and a comprehensive colour film on the lrychirds of Sherbrooke Forest, by Mr. K. C. Halatoff. A summary of the talk is published elsewhere in this issue. A hearty vote of thanks, proposed by Mr. E. S. Hanks and seconded by Dr. M. M. Chattaway, was carried by acclamation. Mr. A. D. Butcher, Chief Inspector of the Fisheries and Game Department, intimated that measures were now being taken to deal with the foxes in Sherbrooke.

Members were informed that Miss Marie Argo had agreed to become the Club's Assistant Librarian. It was announced that the next General Meeting would be held on Tuesday, March 11, as the normal meeting night (Monday, March 10) would be a public holiday.

It was learned that the recipient of the Australian Natural History Medallion for 1957, Mr. C. E. Bryant, would be in hospital for some time, and that the medallion would be presented to him by the President of the National Parks Association, at the April General Meeting of the F.N.C.V., if Mr. Bryant were able to attend.

The President spoke of a proposed membership drive, and requested that those already in the Club should endeavour to interest others in its activities.

Members were invited to contribute, by voluntary donation, to a new fund for Club improvements. Details of this are set out on the following page.

Mrs. A. Duncan, of Canterbury, and Mrs. J. Weeks, of Nunawading, were elected as ordinary members, and Mrs. P. M. Wilson, of Highett, as a joint member of the Club. These were welcomed by the President to the ranks of the F.N.C.V.

Mr. N. A. Wakefield handed the President a cheque for £2/2/-, received as a donation to the Club from Mr. L. B. Wallace, of Gipsy Point in East Gippsland. This was placed in the new improvements fund.

The President reported that the basalt columns ("Organ Pipes") of Sydenham, were likely to be sold for quarrying purposes, and it was resolved that immediate action be taken to endeavour to have this natural monument preserved.

The Meeting closed, after comments on exhibits, at 10.20 p.m.

NATURE NOTES AND EXHIBITS

Mr. E. H. Coghill reported seeing a Black Swan on a reef in the open sea off Point Lonsdale.

Mrs. Daisy Wood exhibited several paintings of scenery and alpine wild-flowers, resulting from her recent trip to Mount Hotham. She showed, too, an interesting collection of the flora, particularly of shrubby everlasting (*Helichrysum*) and other composites.

Mr. J. R. Garnet had on display the comb of a gregarious paper-wasp (*Rhopalidus* sp.), collected on January 26, 1958, from overhanging rock faces near Crooked River at Talbotville, and from which some adult wasps had since emerged.

Miss E. Raff tabled flowers and fruit of the Swan Plant (*Gomphocarpus fruticosus*) and a jar of ripened seeds. This plant is native to South Africa and is the principal food of the Wanderer Butterfly.

Mr. C. J. Gabriel exhibited specimens of the four native Victorian Cone Shells: *Floraconus anemone*, *F. seyravi* and *Pariconus rutilus* from Western Port Bay, and *Floraconus singletoni* from the Portsea Back Beach.

F.N.C.V. FINANCES: A CALL FOR DONATIONS

During the currency of the present Club year, a very heartening trend has become apparent in F.N.C.V. affairs. With the aid of active sub-committees, which consider policies in connection with finance, library and shows respectively, your Council has implemented a vigorous policy which should have far-reaching and beneficial effects on the Club's future.

On November 20, 1957, the Finance Sub-Committee formulated a report which was received by Council on November 26 following, and, after due consideration, adopted by the latter on January 28 last. Two of the paragraphs of the report read as follows:

"It notes that well over £100 is needed to bring the Library up to date especially as to binding, which is badly in arrears, that a modern projector is needed, that the *Naturalist* is deprived of much of its scientific value for want of a cumulative index, and that many other projects of a permanent character are calling for consideration. It therefore recommends that Council call for donations towards a fund to be expended on these matters, as Council sees fit.

"It was reported that the late Mr. Cudmore had left £100 to the Club. In view of his interest in Library work, it is recommended that this amount be donated to the proposed fund."

At the General Meeting of the Club on February 10, the President placed this matter before the members present. The response on the spot was very gratifying, and the new fund is now well under way.

The re-organization of the library and the provision of further facilities, for the benefit of both City and Country Members, will entail a considerable amount of hard work by the comparatively few office-bearers and others who are in the position to undertake these tasks. For those who are not able to devote time and energy to F.N.C.V. administration, this "Club Improvements Fund" now provides an avenue by which many will be able to help in an equally effective way.

Contributions to the fund may be made at General Meetings, or sent to the Honorary Treasurer, F.N.C.V., 400 Collins Street, Melbourne, C.I.

LYREBIRDS OF SHERBROOKE

By K. C. HALAFOFF

(Summary of Address to F.N.C.V., February 10, 1957.)

Until recently, it was customary to study birds as species, making deductions from what were often superficial, though numerous, observations. The idea that real knowledge of the habits of birds begins when they are regarded and observed as individuals is now gaining ground, and this is particularly applicable with birds of high order of intelligence, to which category lyrebirds certainly belong.

Actually, much of our knowledge of these is based on observation of several individual males. James, the first to befriend a human, provided the late Ambrose Pratt with most of the material for his *Lore of the Lyrebird*. Timothy, and later, Spotty, were the objects of years of study by R. T. Littlejohns and L. H. Smith, and they figured in many incidents recorded in their respective books and articles. Naturally, generalizations should not be made from observations in such a restricted field. Instead, comparison of much data is necessary to sort out habits common to the species and those peculiar to individuals.

Six years of observation at Sherbrook convinces me that every lyrebird has its own personality, temper and behaviour, likes and dislikes. They differ just as humans do. Some, especially young birds, are extremely curious, others do not give you a second look. Some devote much time to romance, others prefer a substantial repast first. Some are shy and evasive, others tolerant or even friendly. Undoubtedly they recognize persons, even after long absences or in different dress. And Ambrose Pratt's seemingly incredible story, of the lyrebird called James, and Mrs. Wilkinson of Ferny Creek, no longer appears fantastic to me. A similar friendship could be developed and maintained on the human's not the bird's initiative, as it was in James's case.

For years, patiently and persistently, I cultivated friendly relations with several of the Sherbrooke lyrebirds. Love and admiration, rather than the idea of exploitation, were the motives: and the results have indeed exceeded all expectations. To tame a shy, wild bird in its natural habitat, provides a thrill beyond expression. Spotty provided a comparatively easy start, but gradually the field was extended to less approachable individuals and the overtures usually resulted in sympathetic response.

It was a strict rule never to betray a bird's confidence, and, as always, it paid to be honest. Nothing could compare with the satisfaction felt when the bird demonstrates its trust and even affection; when at your call it comes from the depths of a gully; when, instead of your seeking the bird, it follows you through the forest as you call caressingly; and above all, when the strong black

beak confidently, and with surprising gentleness, touches your palm as it takes your modest offering of food, while you are holding your breath, overwhelmed with joy and admiration.

The list of such unforgettable moments grows with every visit to the forest. Now, a hen-bird graciously accepts a small musk twig which she dropped and which you have placed in her path, and she carries it to her nest and incorporates it in the structure. You feel that your collaboration has been appreciated.

Another time, finding Spotty vainly seeking food in the hard, dry soil, you manage to shift a heavy moss-covered log a few inches, and the clever bird comes immediately to the area of wet soil and rotten wood for his first substantial meal that day. Your satisfaction is greater than if you were eating your choicest dinner in the best hotel in Paris.



The Author and Spotty in Clematis Avenue

Birds occasionally respond to the imitation of certain calls. One hen-bird used to reply to me in Pilot-bird's language. Once, when approaching Spotty at his singing, I imitated a Rosella to announce myself. He at once repeated the call, but in corrected, more musical version, and he uttered it from time to time through the song, as if to impress it on my mind. He has done this once more since then, but not again. Either my rendering has improved or he has given me up as hopeless!

Several years ago, a half-matured male came to wade in the pool near which I was sitting in Odel Gully. I pressed the release of the old 16 mm. Kodak movie camera, borrowed for the occasion, and it whirred loudly. But when it stopped, the bird turned to me and gave a perfect rendering of a camera-motor, but not mine! I recognized the sound of a Bolex H16 with which a photographer had been filming lyrebirds at that spot. It was as if he were saying, "I can do better than you. Listen!"

Later, you are resting, and a year-old chick busily scratches your shoe, trying to determine the nature of the strange thing, while from a few yards away, "mum" watches with what seems to be an amused look. Or you are watching Spotty at his courting, singing and lifting his wings as he follows the object of his interest; and he suddenly remembers he is hungry, and comes to snatch a quick "counter lunch" from your hand, then hastily returns to his wooing.

One friendly hen-bird used to stand on tip-toe, looking into my palm for the dainties I was preparing to offer her; and often, becoming impatient, she would snatch the first morsel from between the fingers of the other hand. Once, before going to her nest, I went to the creek to wash my hands, and heard an excited voice from the track: "Look! There's a bird, right behind you!" Sure enough, as I had not announced myself on arrival, she had decided to find me on her own initiative. The startled observer were a young tourist couple, and they wanted to know, "Is it your bird?" "What is its name?" and so on.

There are also obligations in every friendship, and your trusting winged friends may call upon you for help. Once, Spotty became quite excited, uttering alarm hisses almost in my face, a thing he had never done before. I did not realize the trouble, due to "the stupid human lack of perception", and managed to quieten him with soothing words. However, a few days later, we investigated more persistent alarm hisses near the same spot and found a hen-bird excitedly jumping on logs and stumps, calling and looking upward. Then we saw it, a great owl with a freshly killed possum in its talons. A male lyrebird soon joined the commotion, and we hunted the owl away, following from tree to tree. Two young male birds joined in, and the four lyrebirds followed us, taking no notice of our shouting and arm-waving. But, when the owl was out of their own territory, they immediately forgot the recent danger, just as children do, and began to play.

To love the lyrebird first, and to allow the desire for pictures only a second place, may produce some comical frustrations. My friendship with Spotty, especially since I have concentrated on movies, has grown to such a proportion that, on seeing me, he terminates his business and comes to me. Often I have crept towards him through the bracken, hoping to obtain a few feet of his matinée performance, only to be recognized before I was near enough, and to have him immediately fold his tail and come to me with an inquiring, friendly look. But I never regretted such lost opportunities.

These are a few of one's experiences in Sherbrooke. Some may think them too idyllic to be true, but no magic power is needed to achieve such close relations with the lyrebirds. I believe anyone with sufficient love and patience can do the same.

There are however a few hardened and suspicious hearts that cannot be won. Spotty's original mate died about two years ago, and his new spouse was such a case. The story begins with the arrival of a raven in the vicinity of the nest, which was high in the fork of a great Mountain Ash. Blacky, as we called the hen, was on the last stage of her flight to the nest, but on hearing the intruder, she flew down from the branch. Later, she sat near the nest and repeated the raven's call a dozen times to the chick, by

PLATE X



Lyrebird's Toilet

Above: Spotty Takes a Dip, in Odel Gully
Below: Drying operations. Note the Tail-feather in Beak

way of a lesson. Imagine my consternation when, a fortnight later, when the chick had left the nest, Blacky saw me approach and, jumping on to a log, imitated first the raven, then a dog, then an owl, and so on. I got the idea that she was telling the chick that I was worse than them all. The lesson was apparently a success, for I was never able to approach within filming distance of that chick!

But most of the lyrebirds are of friendly disposition, and if you follow that St. Francis path, the number of your winged friends will grow steadily. They will locate and follow as you wend your way through the forest, and feed, play and sing near where you sit. Some of them will spend the day in your vicinity, bathing, preening, performing, chasing each other, and coming to you for morsels of food. It reminds one of scenes from Disney's "Snow-white", or perhaps it may awaken more ancient memories of a blissful Garden of Paradise.

My films are but by-products of friendship with the lyrebirds, all taken with a normal-focus lens and hand-held camera. I resented the idea of planting a tripod or a series of shining reflectors in front of nest or mound, thus interfering with a bird's normal routine. They are free too from any kind of fake, such as the placing of a piece of bark over a nest, the removal of natural screening from about a mound, or—worst of all—the fishing of the chick from a nest and the placing of it on the platform. One wonders indeed how anyone can enjoy such photographs, remembering the frantic alarm cries of the hen and her chick. Besides, such a picture is valueless to the serious ornithologist who knows that a young chick does not come on to the platform until about to leave the nest.

Normally, the chick is practically invisible, sitting deep in the cavity, except during the delivery of droppings or to catch an occasional ray of sunlight. So there is little of it on my film until it is out of the nest. Then mother allows me to film her offspring, for she recognizes a harmless creature who is even helpful on occasions.

The result of our friendly relations was that they acted naturally in my presence, only becoming agitated or afraid when strangers approached. For the most part, I was the lone witness of the recorded events, which included a "kiss" which occurred while I was standing above the mound in full view of both birds.

But neither colour film nor words can reproduce that fairy-tale atmosphere that is part of the lyrebird's very being. It is what was stressed in Littlejohns' and Pratt's books. I wholeheartedly agree with their sentiments. The lyrebirds to me are much more than ordinary, however rare, birds; they are the winged fairies of Sherbrooke Forest, its silvery voice, its enchanted soul. Eight years ago I came under the spell while reading *The Lore of the Lyrebird*.

A year later I saw Sherbrooke and my first lyrebird, and I have been in love with both ever since.

We tend however to forget that these birds are precariously balanced on the brink of extinction, due to low fecundity and to natural enemies. The ever-increasing foxes and stray cats are responsible for losses of chicks, few of which survive beyond two years of age. There is also human interference with nesting birds and their offspring, causing occasional but too frequent loss. The encroaching on Sherbrooke of settlement and man's activity, and the increasing disregard for the ban on motor traffic through the forest tracks, is driving the lyrebirds deeper into the gullies or causing them to migrate.



Glory of the Lyrebird's Tail

Already, many feeding areas which used to provide for dozens of birds, mostly north of the firebreak and Clematis Avenue, are practically empty. Their numbers have diminished sharply over the past few years, mainly due to fatalities to young chicks. This must be checked before it is too late, otherwise the tragic vision of an empty, silent Sherbrooke, devoid of its lyrebirds, may become a reality. That would be a sorry day for nature-lovers and tourists alike, as there is no substitute for those uniquely tame lyrebirds whose presence we are inclined to take for granted.

Overseas tourists are not much interested in Moomba or the foundation of the King Street bridge; they ask to see the natural wonders of the country. Of these, the lyrebirds are perhaps the

greatest, and Sherbrooke is the only place where they are tame enough to be seen easily. It is to be hoped that effective measures will be taken to protect this great tourist attraction from further spoliation. Already, an effort to deal with foxes, stray dogs and cats is under way; but we should spare no effort until Victoria's most precious gem—Sherbrooke Forest—is proclaimed a National Park and so placed, together with its unique lyrebird population, under the shelter of efficient administration.

THE AUSTRALIAN NATURAL HISTORY MEDALLION

1957 Award to Charles E. Bryant

The congratulations of the Field Naturalists Club of Victoria is extended to Charles Bryant on whom has been conferred the 1957 award of the coveted Australian Natural History Medallion.

It is scarcely necessary to list Bryant's achievements in the cause of natural history in this country, for his long association with the Royal Australasian Ornithologists' Union and its journal, *The Emu*, has made his name familiar to ornithologists and bird lovers throughout Australia and far beyond its shores. However, we may mention some of his notable attainments—not all of them necessarily related to the purpose of the Award.

Nature photography has been one of his interests, and Bryant's bird studies are well known and much appreciated by those who have had the pleasure of seeing them in illustration of any of his lectures. For the past twenty-five years, the editorship of *The Emu* has been one of his spare-time occupations, and the standing of this journal in ornithological circles bears witness to the care and sound knowledge of its editor.

Members of the Club know him as its legal adviser in the matter of its incorporation as a limited liability company some years back, no less than for his affability and eloquence as a speaker and lecturer on the natural history of birdlife. Some will recall his exploits of younger days as a walker and mountain trumper. There is a select band of people who have crossed the Barry Mountains in the north-eastern alps, in the days when the Barries were a formidable challenge to walkers. The Melbourne Walking Club has a special and honoured designation for these folk—"The Barry Mountaineers", an honour for which Bryant has qualified and one he shares with our esteemed member James Willis and the late Bill Burston.

Lastly we should, perhaps, recall that Bryant is an Honorary Associate in Ornithology at the National Museum of Victoria and he is one of the Trustees of the famous Ingram Trust which comes to our notice occasionally.

—J. R. GARNET

F.N.C.V. GEOLOGY DISCUSSION GROUP: SYLLABUS FOR 1958

Meeting—February 5: Geological Holiday Experiences, by members.

Meeting—March 5: Geology in Colour, by members.

Excursion—Saturday, March 8: Olivers Hill, Frankston. Leader: Mr. Baker.

Meeting—April 2: Petrology, with the Microprojector, by Mr. McInnes.

Meeting—May 7: Introduction to Sedimentation, by Mr. Baker.

Excursion—Sunday, May 11: Melbourne Hill-Cave Hill, Lilydale. Leader: Mr. Baker.

Meeting—June 4: Living Fossils, by Mr. Nielsen.

Meeting—July 2: Minerals, by Mr. Cobbett.

Excursion—Saturday, July 5: Mineral Gallery, National Museum. Leader: Dr. Beasley. (This excursion is subject to alteration.)

Meeting—August 6: The Coastline of Victoria, by Mr. Fisch.

Meeting—September 3: What is a Fossil?, by Mr. Jeffrey.

Excursion—Sunday, September 7: Mystery Excursion. Leader: Mr. Heminy.

Meeting—October 1: Further Studies in Volcanism, by Mr. Blackburn.

Meeting—November 5: Literature Night, with Mr. Gill.

Excursion—Sunday, November 9: Glacial Rocks of Coimadai. Leaders: Mrs. Davies and Mr. Dodds.

Meeting—December 3: Gem Stones, by Mr. Davidson.

The Group meetings are held at the National Herbarium, The Domain, South Yarra, commencing at 8 p.m. on the dates shown. Details of excursions are given at meetings preceding them, or may be obtained from the Group Secretary, Mr. A. A. Baker, Phone JJ 2569.

BENDIGO F.N.C.—SYLLABUS TO JUNE 1958

Meetings at School of Mines, 7.45 p.m., on second Wednesday of each month (except April):

February 12: Holiday Observations, by members.

March 12: History of Basaltic Flow and Basaltic Columns of Campaspe, by Mr. F. Robbins.

April 16: Specimens and Lectureettes, by members.

May 14: Colour Slides Display, by Mr. W. Sones.

June 11: Nature on Postage Stamps, by Mr. E. Phillips.

Excursions are as follows:

Saturday, February 15 (half day)—General: Axe Creek and Sugarloaf Hills. Leader: Mr. J. Kellani.

Sunday, March 16 (full day)—Geology and Basaltic Flows: Barfold, Mitchell Falls. Leader: Mr. F. Robbins.

Sunday, April 20 (full day)—Aboriginal Quarries: Mount William. Leader: Mr. F. Robbins.

Saturday, May 3 (half day)—Botany: Blue Jacket Reservoir. Leader: Mr. A. Ebdon.

Sunday, May 18 (full day)—Birds and General: Lake Cooper. Leader: Mr. R. Allen.

Sunday, June 29 (half day)—Acacias. Whiststick. Leader: Mr. W. Perry.

Members of other Naturalists Clubs, who may be visiting Bendigo, are invited to attend functions of the local Club.

Secretary: Mr. A. C. Ebdon, 45 Lucas Street, Bendigo.

BOOK REVIEW

J. H. Willis: "Victorian Toadstools and Mushrooms"

Though not the first appearance of this book, it merits more than passing comment, for, although published by the F.N.C.V., it was never reviewed in this journal.

Vascular plants are usually well documented; and popular, illustrated booklets on these groups have long been available to the student in south-eastern Australia. There was no simple local guide however, to any group of the lower plants, and Willis made the first major step towards the rectification of this state of affairs.

His book deals with the Gilled Fungi—the agarics. In popular terms these are, as the title of the work indicates, our toadstools and mushrooms. In turn, 120 species are treated, and one learns their features, where they grow and their culinary merits.

It is interesting to note that several of the larger toadstools are "both delicious and flavoursome"; and the popular misconception that all toadstools are poisonous is further dispelled by the information that "90 per cent of all deaths from fungal poisoning are caused by one particular species which is unknown in our continent".

As well as dealing with gilled fungi, the book devotes about one-fifth of its length to other groups: Punks, Black-fellows' Bread, Coral Fungi, Puff-balls and the like, and the remarkable Vegetable Caterpillars.

There are copious illustrations. The four colour plates provide an aggregate of 26 species in their attractive natural hues, there are 13 half-tone plates, mainly of photographs *in situ*, and the 18 text-figures include ten lucid line drawings by the author.

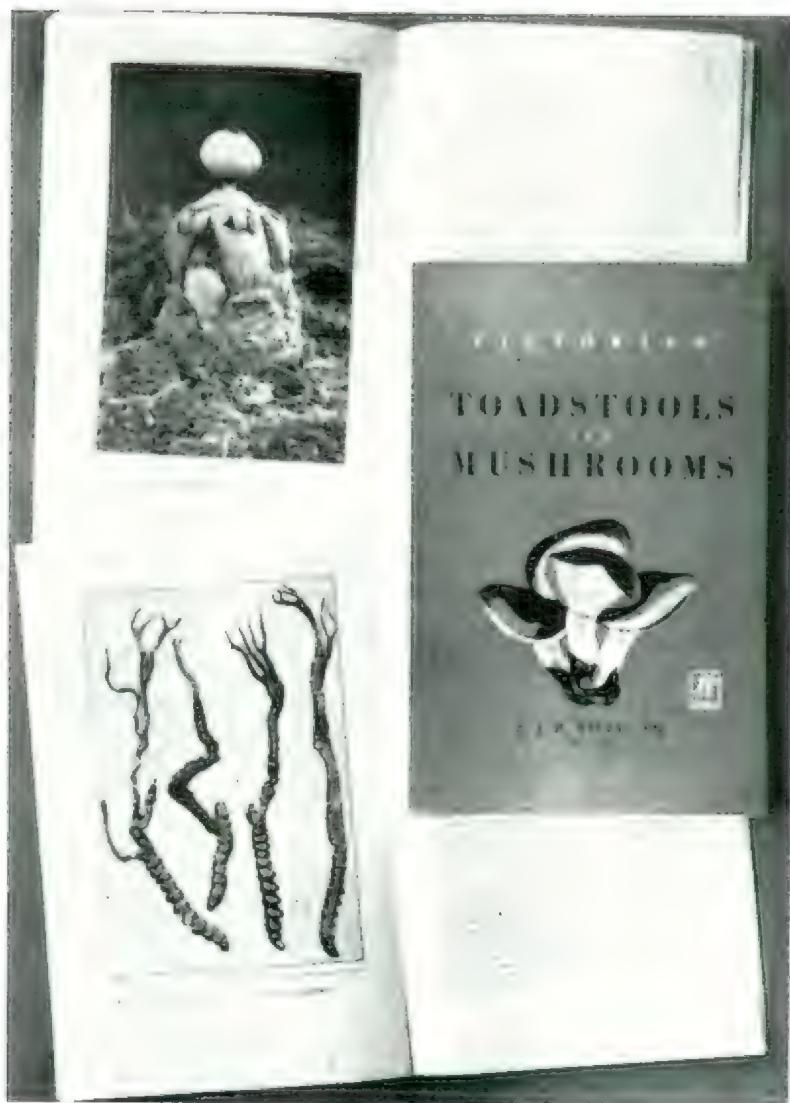
The first issue of this book came in 1941, as *Victorian Fungi*, and it appeared again in 1950 as *Victorian Toadstools and Mushrooms*; so this third issue is actually the second edition of the present title. Earlier issues were merely stapled into thin covers; but now we have a book durably bound, with stiff cover and lettered spine. It is larger than before—about 100 pages including the plates, the arrangement tends towards greater clarity, and an index has been added.

Two omissions occurred during the editing and printing of the book. The attractive frontispiece should have been acknowledged to the late Mrs. Ellis Rowan; and in line 4 of page 78, one needs to insert the phrase "and *Inonotus tabacinus* on *Nothofagus*;" between *Fomes tasmanica* and *Inonotus dryadeus*.

The book is modestly priced at 6/-, and it may be obtained from leading booksellers, or (post free) from the Sales Officer, F.N.C.V., National Herbarium, South Yarra, S.E.1.

—N. A. WAKEFIELD

PLATE XI



The F.N.C.V. Fungus Book

ERRONEOUS OR DOUBTFUL RECORDS OF BIRDS FOR GIPPSLAND

By N. A. WAKEFIELD

The following comments are supplementary to those published under similar title in the January 1958 issue of this journal: *Vict. Nat.* 74: 134-138.

While it is realized that stray bird specimens may reach places far removed from their normal habitats, the writer considers that it is better to err on the critical side and to regard as erroneous any unconfirmed record which is out of keeping with what is now a fairly clear picture of species distribution in the region concerned.

It would be gratifying if further information were to come to light to substantiate some of the records discussed, but in the meantime it is considered that circumstantial evidence discredits the following ones.

1. Ref. *Vict. Nat.* 22: 191-223—"Excursion to Wilson's Promontory". On page 199 is the entry: "Mrs. Hardy has kindly furnished . . . a list of species". This includes the following:

p. 201, *Phalacrocorax gouldi*. This is the WHITE-BREASTED CORMORANT, but the record would apply to the Little Pied Cormorant which is common in the area but not noted by the writer. (See Note 1 below.)

p. 201, *Tringoides hypoleucus*. This name applies to the COMMON SANDPIPER, a species rarely observed in Victoria and not otherwise recorded for Gippsland. Probably the entry was based on observation of the Little Stint, not mentioned by the writer but one of the "additional" species noted by another member of the party (J. A. Kershaw).

p. 201, *Puffinus assimilis*. This is the LITTLE SHEARWATER, but the record would apply to the Fluttering Shearwater (*P. gavia*). The latter frequents Victorian waters and should have been included, in place of the former, in J. A. Leach's *An Australasian Bird Book*.

2. Ref. *Vict. Nat.* 25: 149-151—"Biological Survey of Wilson's Promontory", under "Report on Zoology by P. R. H. St. John".

p. 150, *Cheramoeca leucosternum* . . . Black and White Swallow. This refers to the WHITE-BACKED SWALLOW, a bird of the inland, and it is most unlikely that it was really observed at Wilson's Promontory. Probably the report was based on observations of the Tree-Martin, a species not listed by St. John but which is usually present in the area during the warmer parts of the year. (See Note 2 below.)

p. 150, *Phalacrocorax gouldi* . . . WHITE-BREASTED CORMORANT. Again this record would apply to the Little Pied Cormorant, a species not mentioned by the writer. (See Note 1, p. 168.)

3. Ref. *Vict. Nat.* 46: 209-210—"Excursion to Mallacoota Inlet", by V. H. Miller. The WHITE-BREASTED CORMORANT is listed, again evidently in error for the Little Pied Cormorant.

4. Ref. *Vict. Nat.* 58: 102-107—"Birds of Croajingolong", by N. A. Wakefield.

p. 103. It is inferred that the RED-TAILED BLACK COCKATOO visits the coastal areas; but the birds observed (at Mallacoota) would have been the Glossy Black Cockatoo. (See Note 3 below.)

p. 104. Both WHISTLING TREE-DUCK and PLUMED TREE-DUCK are mentioned here, based on reports by a local sportsman. These may well be disregarded, as neither species has otherwise been recorded for Gippsland. This also applies to the comment on the same birds in *Vict. Nat.* 59: 72.

5. Ref. Viet. Nat. 59: 49-54—"Sydenham Inlet in the Autumn", by M. L. Wigan.

On p. 53 "a small party of BLACK-TAILED NATIVE HENS" is recorded. On rare occasions this species makes sporadic invasions into central Victoria, but it is not known to appear in Gippsland. It is considered most unlikely that a group of these birds could have been in far-eastern Gippsland in early 1942, a period when no marked southern movement of the species was apparent.

6. Ref. Viet. Nat. 59: 70-72—"Bird Notes from Croajingolong", by N. A. Wakefield.

pp. 70-71. Comments on the PLUMED EGRET, GREATER FRIGATE-BIRD, REGENT HONEYEATER, GREENSHANK and WHIMBREL were included on the authority of an inexperienced local observer. Hence, those seeking specific information on species distribution would do well to regard these as erroneous records.

p. 71. The BLACK CURRAWONG is recorded at Orbost. The bird concerned was with a flock of the Pied Currawong from which it appeared to differ in having a larger bill and different call-notes. But the Black Currawong is now regarded as being endemic in Tasmania.

Also, if the DIAMOND DOVE mentioned here was correctly identified, it was most likely an escapee from an aviary, for the species has not otherwise been recorded from Gippsland.

7. Ref. Viet. Nat. 60: 53—"A New Bird Finds Our Valley", by Jean Galbraith.

In this article, flocks of the WHITE-BACKED SWALLOW are reported as having been seen near Tyers on 29/10/1942 and 10/11/1942. This is apparently another case of mis-identification. (See Note 2 below.)

Note 1: The Little Pied Cormorant is widespread in Gippsland, both about the coasts and inlets, along inland streams and at lagoons and dams. Apart from its small size, its long tail and white flank distinguishes it from the White-breasted (or "Black-faced") Cormorant. The latter appears to be rare in Gippsland, being apparently confined there to maritime rocks and the sea. Facial colouration is not dependable as a diagnostic feature, for immature birds of the smaller species may be quite dark about the face. The distribution details set out in *An Australian Bird Book* by J. A. Leach are rather misleading.

Note 2: The White-backed Swallow occurs in northern Victoria, frequenting comparatively arid areas. A group of these birds bred in the vicinity of the You Yangs in 1946 and remained about the area for almost a year. This is the only known authentic record of the species for southern Victoria.

Note 3: The Glossy Black Cockatoo, which is by no means glossy in appearance, feeds mainly (or wholly) on seeds of species of *Casuarina*; and it often comes south from eastern New South Wales into parts of East Gippsland. The Red-tailed Black Cockatoo is, as far as Victoria is concerned, an inland or western species. The latter has a varied diet, and many years ago it used to visit the Melbourne area and even South Gippsland. (See A. J. North, in *Viet. Nat.* 12: 336.)

Note 4: A correction must be made to the comments on the White-winged Petrel in the January 1958 issue of this journal (*Viet. Nat.* 74: 154). A specimen was found at Portland in 1952 and the species authentically recorded for Victoria for the first time. (Ref. *The Emu* 53: 149.)

A DISTINCTIVE WEST AUSTRALIAN PHEBALIUM (RUTACEAE)

By J. H. Willis*

PHEBALIUM CANALICULATUM (F. Muell. et Tate) J. H. Willis,
comb. nov.*Eriostemon canaliculatus* F. Muell. et Tate in *Trans. Roy. Soc. S. Aust.*
16: 337 (1896).*Vagatio*: Australia Occidentalis, per regiones interiores auriferae late
diffundens.**LECTOTYPUS:** In Herb. MEL, specimen hanc notulam comitans—
“*Eriostemon tuberculatus* F. v. M. var. *canaliculatus*. Between Victoria
Springs and Ularing, 7-9 Oct. 1875, Jess Young”.

As pointed out by Mueller and Tate (i.e.), the Drummond collection (No. 63) cited by Bentham *Flor. aust.* 1: 343 (1863), under *Phebalium tuberculatum* (F. Muell.) Benth., is referable to a distinct species which they describe as *Eriostemon canaliculatus*. Bentham's diagnosis of *P. tuberculatum* is evidently a composite one, embracing two specific elements (at least), and his statement that leaves of *P. tuberculatum* have the "upper surface channelled" and the "margins sometimes recurved" is misleading—the upper surface is not channelled (except in Ewart's *Eriostemon tuberculatus* var. *megaphyllum* of uncertain affinity) and the margins are always strongly revolute. C. A. Gardner perpetuates Bentham's error in his *Emon. Plant. Occid.* 70 (1930), by citing *Eriostemon canaliculatus* as a synonym of *P. tuberculatum*. The former species is actually much closer to *P. filiforme* Turcz., with similar long-terete, *irrenata* leaves; but it has coarser, tuberculate foliage than in *P. filiforme* and the branches also are distinctly tuberculate.

P. canaliculatum is well represented at the Melbourne Herbarium by specimens from the inland gold-fields—Mt. Churchman to Coolgardie. All these examples show stiffly erect, but slender (15-25 × 0.8-1.2 mm.) shining leaves, which are somewhat thickened toward their obtuse tips and which impart a rather broom-like aspect to the twigs. On a specimen (Herb. MEL) from Cow-Cowling, W.A. (Mar. Koch No. 1232, Sept. 1904), the collector has written "petals pink"—which may be a further feature of *P. canaliculatum*.

In Western Australia the whole subgeneric assemblage, *Euphebalium*, speciated chiefly by leaf characteristics, stands in dire need of revision—with a balanced evaluation of specific limits. The precise differences (if constant) between *P. microphyllum* Turcz., *P. drummondii* Benth., and *P. tuberculatum* (F. Muell.) Benth. need re-defining, whilst the status of *Eriostemon macrophyllus* F. Muell. from the Eyre coastal district, of inland *E. intermedius* Ewart; and *E. tuberculatus* var. *megaphyllum* Ewart; warrant careful investigation—they do not appear, even as synonyms, in Gardner's *Enumeration* of 1930. Meanwhile, I feel justified in according *P. canaliculatum* specific rank; at least, it is quite as circumscribed as any other Western entity now being regarded as a species.

MICROSCOPICAL GROUP

On Saturday, February 15, approximately thirty members of the F.N.C.V. visited the Botanic Gardens Lake to collect specimens of pond-life for exhibition at the Group Meeting on Wednesday, February 19. There was a good attendance also to hear Dr. Maxwell Clark deliver his address on "Radiation Genetics" on the Wednesday evening. The interest of the Group was evidenced by the many questions asked at the conclusion of the address. Mr. Robert Lukey is to be the speaker at the next meeting on March 19, his subject being "Radiolarians". Please bring appropriate slides for exhibition.

* National Herbarium of Victoria.
† *Proc. Roy. Soc. Vict.* n. ser. 15: 39-50 (1906).

EXCURSION TO AYERS ROCK

A three-weeks bus tour to Central Australia, accommodating 36 persons, will be conducted by Mr. G. C. Kennewell, Bull's Motor Tours, Adelaide. It will leave Melbourne on August 16, and return on September 7, 1958. The route will be via Adelaide, Woomera, Lake Hart, Coober Pedy, Everard Ranges, Ayers Rock (3 days), Mt. Olga (3 days), Henbury, Alice Springs and MacDonnell Ranges (3 days).

Each member will be required to provide his or her own camping gear and eating utensils, preferably packed in an army kit-bag, weight not to exceed 50 lb. All provisions will be arranged by the organizers and a chef will accompany the tour.

The cost per person will be £60, and applications should be sent to Mrs. R. A. Sinclair, 22 Haldane Street, Beaumaris, Tel. XF 4515, accompanied by a deposit of £20, the balance to be paid on or before June 23, 1958. The deposit will be refundable to June 23, and the organizers reserve the right to cancel the tour if circumstances warrant it.

WHAT, WHERE, AND WHEN

F.N.C.V. Meetings:

Monday, April 14—Presentation of 1957 Natural History Medallion to C. E. Bryant.
 "Club Excursion to Genoa District", by N. A. Wakefield.
 Monday, May 12—"How to Collect Insects", by A. N. Burns.
 Monday, June 9—Annual General Meeting and President's Address.
 Monday, July 7—Members' Night.

F.N.C.V. Excursions:

Sunday, March 16—Combined Excursion with Bendigo F.N.C., to Barfield and Mitchell Falls. Leader: Mr. F. Robbins. Parlour-coach will leave Batman Avenue at 9 a.m. Fare, 19/-. Bookings with Excursion Secretary. Bring two meals.
 Saturday, March 29—Entomology and Marine Biology Group excursion to Wonga Park. Take the 9.45 a.m. train to Croydon, then bus to Wonga Park. Bring one meal.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated.)

Wednesday, March 19—Microscopical Group.

Friday, March 21—Botany Group. This meeting will commence at 7.45 p.m. with a short talk by Mr. A. J. Swaby, dealing with "Botany for Beginners". Speaker for the evening will be Mrs. Pinches.

Members are reminded that meetings are being held at the National Herbarium again, and there will be somebody at the corner of St. Kilda and Domain Roads at 7.40 p.m. to accompany anyone who does not wish to cross the Domain alone.

Monday, March 31—Entomology and Marine Biology Group. The meeting will be held in Mr. Strong's rooms in Parliament House at 8 p.m. Use private entrance at south end of House.

Wednesday, April 2—Geology Group. Speaker: Mr. D. McInnes. Subject: "Petrology—With a Microprojector".

—MARIE ALLENDER, EXCURSION SECRETARY
 19 Hawthorn Avenue, Caulfield, S.E.7

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PROCEEDINGS

Mr. J. R. Garnet presided at the General Meeting at the National Herbarium on March 11 last. He referred to the sudden death a few days before of Mr. P. C. Morrison, Director of National Parks and well-known naturalist and journalist. Mr. Morrison joined the Club in July 1918, was Honorary Secretary in 1919-20 and President in 1941-3; and he was awarded the Australian Natural History Medallion for 1947. Mr. Garnet was supported in his eulogy by Mr. A. D. Butcher, Director of Fisheries and Game. All present stood for a minute in silent tribute.

Miss Ina Watson delivered an address, "Our Natural Heritage"; and the talk was illustrated with an outstanding series of colour slides. The President conveyed the thanks of the Meeting to Miss Watson.

It was announced that nominations for the 1958 award of the Natural History Medallion should be handed to the Secretary before the Council Meeting of March 25.

The President reported that the Finance Sub-committee had recommended that members be invited to become "supporting members", by paying an additional 10/- or more over and above the normal annual subscription. This was put to the Meeting as a motion and carried. (See page 173.)

A letter was received from Mr. J. H. Willis suggesting that two of the Amy Fuller paintings be donated to her nieces. This was agreed to, and it was decided too that two of the collection should be displayed at each General Meeting.

Members were reminded that nominations for Office-bearers and Council would be received at the April General Meeting.

New members were elected: Mrs. R. J. Baldwin of Bunyip, and Mr. Victor Jacobs, Mr. K. C. Hataloff, Miss Joy Scott and Miss Annette Cummins of the Melbourne area. The President extended them a cordial welcome to the ranks of the Club.

Members were invited to practise for the Club Nature Show by preparing exhibits for the "Members' Night" to be held on July 14 next.

A number of nature notes were given and exhibits commented upon, and the gathering adjourned for the usual conversazione.

F.N.C.V. RULES

Members who wish to have a copy of the Club's "Articles of Association" and/or the By-laws, may obtain same by making application to the Honorary Secretary.

NATURE NOTES AND EXHIBITS

Miss Young showed a collection of artefacts and geological specimens from Barwon Heads. Snails from the Mediterranean had emerged from the concretions.

Mr. Coghill showed specimens of millipedes from North Kew, and mentioned that though they were in plague numbers on one side of his street, they had not appeared on the other.

Mrs. Fisch reported seeing many small seedling Cabbage Palms unlike the adult ones in East Gippsland, and remarked on the absence of any intermediate sizes.

The President reported that, in his garden, in the forenoon of a warm, sunny February day following the mid-month rains, the opercula from the flower-buds of an eight-year old Mahogany Gum commenced to rain down with a steady patterning. Bees from a nearby hive promptly swarmed to the flowers for the abundant nectar despite the falling caps.

Also, Mr. Garnet exhibited two specimens of young of the White-lipped Snake (*Demansia coroocides* var. *masteri*, Krefft). The mother, 15 in. long, was collected beneath a log at Kinglake on March 1, and later, by accident, was killed. A brood of four young, each about 5 in. long, clearly showing the characteristic white lip, were found on dissecting open the parent snake.

THE CLUB'S ANNUAL PICNIC—NOVEMBER 5, 1957

Strath Creek was selected as the central point of a "round trip" excursion on Cup Day 1957 because it was a district of considerable natural history interest and one not hitherto visited by the Club. As leader, the President introduced an innovation for excursions of this type by providing each member of the party with a duplicated "itinerary", which included notes on many features of natural history and of historical significance for the whole of the route. The weather throughout the day was delightful and thus the party of about forty participants were able to take full advantage of the information thus provided. By means of it those unfamiliar with the districts traversed were enabled to appreciate the all-important influence of a geological formation on both the ecology and scenery.

The passage along the Hume Highway through the volcanic plains between Coburg and Kilmore provided a sharp contrast with the rolling, deeply dissected hills of the silurian formation between Broadford and Strath Creek and the forest country between Flowerdale and Kinglake West. From the summit of Pretty Sally over which the Hume Highway crosses the Great Dividing Range, the panoramas are fine, but those seen from the top of She Oak Hill and the Murchison Gap are magnificent. Between She Oak Hill (so-called because several Casuarinas still survive on or near its summit) and the Gap, a stop was made near Tyuak to examine Dahyminga (or Reedy) Creek. The stream, a tributary of the Goulburn River, was of interest because of its charming surroundings and by reason of the presence of several horizontal rock bars through which it had cut and, possibly, as it is one of the streams responsible for scouring the anerobic reefs hidden in the surrounding hills and valleys.

Some miles further on the old coach road, clearly visible on the top of Murchison Gap and lower down where it again crossed the road, was a last point of interest for inspection before the descent along the steeply winding road to the quiet little settlement of Strath Creek. There we lunched in the shade of some stately old eucalypts in the township's picnic ground beside the State School.

After lunch the party journeyed along the valley of King Parrot Creek into which stream Strath Creek flows. Both streams are frequented in season

by anglers, and the tree-lined banks provide shelter for an abundance of bird life. The road to Flowerdale follows the course of the creek as it wanders quietly through its broad swampy valley towards Strath Creek and an occasional stop was made to examine the birds. Several flocks of Straw-necked Ibis and White Cockatoos were seen, and the bird observers noted a number of other swamp birds, particularly during the stop when attention was diverted to a radio description of the Melbourne Cup.

Not a great deal of attention was given to the botany in the stopping places, but special features were noted for future closer inspection. Among the plants seen were some Rotee-brushes (*Callistemon*), not yet in bloom, on the banks of Dahyninga Creek, beside every stream a profusion of Black Wattle, the tender young pods clustered in profusion and gleaming bright crimson in the sunlight, mistletoe, sometimes in flower, on every second eucalypt along the roadside near the Gap, a cluster of bright golden *Veltheim* on the bank of the same road, Sun Orchids and Rock Fern on the old coach road, tea-trees, wattles and eucalypts on the banks of the King Parrot Creek, reeds and rushes in the swamps, Tree Violets galore on the way to Flowerdale, and then, further on, the vegetation so typical of the Siberian forest as we left the creek valley and rose to the heights of Tommy's Hut.

At Kinglake West we stayed for an afternoon meal and, towards the end of a very pleasant day, descended from the ranges to Whittlesea, and thence back to Melbourne through much the same kind of country we had passed through on the journey out in the morning: rock-strewn basalt plains with their Red Gum savannah and grass lands.

—J. R. GARNET

"SUPPORTING MEMBERSHIP" OF F.N.C.V.

At its meeting on February 20, 1958, the Finance Sub-committee decided upon the recommendation that a system of "Supporting Membership" be introduced into this Club. It was considered that this might result in sufficient extra general income to avoid either an overall increase in annual subscription rates or a reduction in the amenities now enjoyed by members. It was pointed out that a similar system is in operation in the Melbourne Bird Observers' Club, and that it is the general rule with clubs of this kind in some overseas countries.

This recommendation was approved by Council on February 25; and on March 11, Mr. E. H. Coghill moved in General Meeting, "that Members be invited to become Supporting Members by paying an additional subscription of 10/- or more per year, such membership to be a private matter and to confer no extra privilege or distinction". After some discussion, including a suggestion that the standard of the *Victorian Naturalist* should be reduced instead, Mr. Coghill's motion was seconded by Miss M. Elder, and the Meeting carried it by an almost unanimous vote.

It must be emphasized that the annual subscription rates for F.N.C.V. membership remain unchanged, and that no member should feel in any way obliged to increase his or her subscription and thus to become a Supporting Member. Such action should be completely voluntary and should be taken only by those who feel both able and willing to do so. Those who choose to become Supporting Members should add to their normal subscription for the 1958-9 Club year, any sum they feel inclined to, from 10/- upwards.

This matter is now put before all members for their individual consideration, as part of your Council's attempt to carry on a vigorous, progressive policy of maintaining and improving the work of the Club and its service to members despite the increased costs to be met as a result of such a policy.

THE DISCOVERY OF THE SYDNEY FUNNEL-WEB SPIDER (*ATRAX ROBUSTUS*) IN VICTORIA

By N. A. WAKEFIELD

On January 26 last (1957), while gathering wood in the bush on the south-west fringe of the township of Mallacoota in East Gippsland, the writer found two large spiders under a sizable billet of wood. These were preserved in methylated spirits and submitted eventually to the National Museum of Victoria. Mr. R. A. Dunn reported that he could not distinguish them from *Atrax robustus*, the notorious funnel-web spider of the Sydney area.

At about the same time as this discovery, Mr. A. R. Wakefield captured and preserved a similar spider from under a log in the vicinity of Noorinbee in the Cann River valley, about fifty miles west of Mallacoota. These three specimens were examined also by Dr. Saul Weiner who was at the time endeavouring to develop a serum to counteract the effects of the venom of this species. He too considered that they were *Atrax robustus*.

One of our Club members, Mr. E. Byrne of Black Rock, found further examples of the same spider while at Mallacoota during the following Easter season, and he showed some spectacular coloured slides of these individuals at the General Meeting of the F.N.C.V. on August 12, 1957.

All were females however, and it was considered necessary to have an adult male specimen to establish the identity of these spiders beyond doubt. The task of providing such was passed on to our country member, Mr. F. J. Buckland of "Sunny Corner", Mallacoota. He was informed of the habits of the species and it was suggested that he investigate the bush in the vicinity of his home. Although that is about three miles from the site of the original discovery, the search proved most fruitful.

In a letter dated May 6, 1957, Mr. Buckland wrote: "We could have filled dozens of jars. One big log which we turned over had six under it. We turned logs over and found webs; some were not under the ground at all, but in a sort of tunnel scraped out where the log was partly buried in the soil. The tunnel of course was lined with the silk-like web. Some were nearly a foot under the ground. We got to the stage where we were tipping spiders out of the jars in order to put better specimens in. There is no doubt about them coming out fighting; we saw them with the venom, as you said, dripping from their fangs."

One of the specimens from near "Sunny Corner" was an adult male, and its characters were those which distinguish *Atrax robustus* from other species of the genus.

On June 16, the writer investigated the granitic area known as "Genoa Falls" beside the Princes Highway about three miles west

of Genoa, and found further examples of *Altrax robustus*; and the next day, a score or so more were found, including further males, under logs and amongst granitic rocks on a ridge a mile north-east of Noorinbee. One of these became a television star, and performed most ferociously too, on ABV2 in the programme "Melbourne Magazine" on June 19.

The female funnel-web spider is stout in build, with comparatively short legs, and is black in general colour. The underside shows a patch of reddish hair about the jaws, two pale patches on



Female Funnel-web Spider at Home.

The lair was revealed when a log was rolled away
at Noorinbee, East Gippsland.

the forward part of the abdomen, and whitish leg joints. The largest Victorian specimen found so far was of the following dimensions:

Leg span: Front to back—2·4 in. (6 cm.); side to side—2 in. (5 cm.).

Cephalothorax: 0·5 in. long, 0·4 in. wide (13 mm. \times 10 mm.).

Abdomen: 0·6 in. long, 0·5 in. wide (15 mm. \times 13 mm.).

Jaws: 0·3 in. long (7 mm.).

Total length of body, including jaws: 1·4 in. (3·5 cm.).

The male is smaller in body but its legs are much longer in proportion. As in other species of the group, the pedipalps (or "feelers") of the male are each terminated by a reflexed needle-pointed segment somewhat resembling the sting of a scorpion; but

PLATE XII



Examples of the Funnel-web Spider, *Atrax robustus*, from
Mallacoota, Victoria.

Upper left: Female, ready to strike.

Upper right: Male, in fighting attitude. Note spurs on tibiae of
second pair of legs.

Middle and lower, left: Female, upper and under sides respectively.

Middle and lower, right: Corresponding views of male. Note the
distinctive pedipalps.

(Specimens are shown about natural size.)

it is the remarkable spur on one segment (the tibia) of each of the second pair of legs in the male that distinguishes *Atrax robustus* from other related spiders. (See Plate XII.)

The genus *Atrax* embraces some eight species, and it ranges from Queensland to Tasmania. Although members of the family (Dipluridae) are popularly known as "trap-door spiders", they do not construct hinged doors at the mouths of their holes. It is best therefore to refer to them as "funnel-web spiders".

These, together with many species that do make lids for their burrows, belong to the sub-order Mygalomorphae of the spiders (Order Araneida). These mygalomorphs have the fangs hinged in such a fashion that they are parallel and point forward when the spider rears up to strike. In other groups, the fangs point towards each other and operate pincer-fashion.

Thus, when the funnel-web spider becomes aggressive, it rears up with two pairs of legs raised and spread out; then it strikes forward and down, attempting to grapple and cling with its legs and thus drive its fangs in. The fangs of a large specimen are about a quarter-inch long, and, when the spider is aggravated, drops of clear venom make beads, about as big as pins' heads, at the tips. Persons who have been bitten recount that it took a strong blow to dislodge the attacker.

Atrax is held responsible for the death of five persons in the Sydney area, the first in 1927 and the last in 1949. A boy two years of age and a girl of five each died within about an hour and a half of being bitten, and a youth of fourteen and two women each died within about twelve hours. In two of these cases the killer was not kept for identification, but the other three spiders proved to be males. Thus it seems that *Atrax* reverses Kipling's law, that "the female of the species is more deadly than the male".

There have been many other reports of bites by both males and females of the Sydney funnel-web spider when the victims survived. In fact, in some cases the spiders apparently injected little or no venom. Several of the survivors were treated as for snakebite, with ligaturing, incisions and the induction of bleeding. As the venom is neurotoxic (that is, affecting the nervous system) the effectiveness of this treatment would seem to be in its removing a proportion of what might have been a lethal amount of venom.

The males in particular often wander somewhat at night, and many have been found inside houses in the Sydney area. Some bites have been due to spiders taking refuge in footwear. The normal "den" is in a rock crevice or under a stone or piece of wood, and from the mouth there is the typical funnel-shaped web, usually with several "guy-ropes" to hold it in position. Moisture is necessary, and the spiders soon die if placed in dry conditions or in sunlight.

Until this year, *Atrax robustus* was thought to be restricted to central-eastern New South Wales, from the Gosford area (sixty miles north of Sydney) to Lakeinba, south of, and a little outside, the limits of the city. It was suggested by some that the occurrences south of Sydney Harbour were accidental, the spiders having been introduced from the north, in loads of earth and such. In view of their discovery in eastern Victoria however, one suspects that they are present in south-eastern districts of New South Wales.

Since a report of the finding of *Atrax* in East Gippsland was published in the *Sun* on June 8, 1957, a great number of spiders of related species have been sent to the writer for comment. They have come from about Melbourne and Geelong and from both central Gippsland and the north-east of the State. Examples of these are awaiting the attention of Mr. Dunn, and it is intended that notes on them will be published eventually in the *Victorian Naturalist*.

During the past year, the writer has searched for funnel-web spiders about the Orbost district, in the vicinity of the Gippsland Lakes and in the sandstone gorges of the Mitchell River valley. Other species of the *Mygalomorphae* are present in each of these areas but *Atrax robustus* has not been found. Available evidence suggests that this latter is restricted to the granitic country of the Cann River-Genoa-Mallacoota district and that it is not elsewhere in Victoria.

BOOK REVIEW

The Forests and Forest Conditions in the Territories of Papua and New Guinea

J. S. WOMERSLEY & J. B. McADAM [Government Printer, Port Moresby, Aug. 1957. 9 $\frac{1}{2}$ " x 7". 62 pages. 9 photographic figures. No price indicated.]

During World War II more than 80 million super feet of sawn timber, worth about £2,000,000, left the forest mills of New Guinea. At the same time, forest resource surveys were pushed ahead in the Territory, and the collection of wood samples with voucher botanical specimens became the nucleus of a Territories Herbarium at Lae—now augmented to some 12,000 sheets of specimens. Since 1950 a Land Resource Survey team has concentrated on the collection of field data, while aerial photography of vast regions is keeping pace with the ground assessment. These facts we learn from a small but highly informative Government booklet which was brought out last year for the benefit of the British Commonwealth Forestry Conference held in Australia.

The joint authors (Womersley and McAdam) are to be complimented on a worthy contribution to the ecological literature of our near-north. They describe succinctly the principal forest formations of New Guinea (including their dominant trees), discuss forest policy, give notes on 22 of the more abundant and useful tree-species and conclude with a bibliography of important references to the flora and timbers of Papua-New Guinea. There are several good photographs of tree communities, that of the pine *Araucaria klinkii* being impressive. Appendix III comprises a field key to the arboreal species of certain tidal forests; this is the work of Mr. A. G. Floyd, formerly Plant Ecologist at Lae and a member of this Club.

—J. H. WILLIE

FURTHER OBSERVATIONS ON THE GEOLOGY OF THE TAMAR RIVER

By RON. C. KERSHAW

Introduction

In Tasmania, the extensive estuary of the Tamar River is the most conspicuous feature of the North Coast. Some features of the adjacent topography and the relation of this to the river are discussed.

An outline of some of the geological features of the valley were set out in a previous work (Kershaw, 1955), but certain notes were held over for further study. A paper by Carey (1947) had been overlooked, but the ensuing paper is correlated with his work.

The Tamar area will be discussed, first in relation to present-day features and secondly in relation to the Tertiary lakes. These notes are not a detailed study of the geology of the area, they are made in conjunction with considerations of general ecology.

Present Physiography

1. Coast and Headlands

The mouth of the Tamar is bounded by Low Head on the east and West Head to the west, these being terminals of low dolerite ranges. Low Head, jutting out into Bass Strait, is a rounded hill of moderate height fringed by a sloping primary major platform eroded in the dolerite (terminology: Jutson, 1950). The backshore is grassy and of moderate slope, there being no precipitate cliff as at West Head. To the east the sandy beach is backed by dunes, with Five Mile Bluff the most prominent feature. Between Low Head and George Town, the estuary shore passes from dolerite to Permian sediments above which are terrace deposits.

West Head is a much more extensive and higher headland than is Low Head. The dolerite rises in a series of peaks joined to the west in a continuous range with a sheer scarp face passing into the sea as vertical cliffs a hundred feet high. The landward end of this scarp is partly masked by talus. At the foot of this slope are sand-dunes, all fixed by vegetation, lining the shore westerly to Badger Head. There is no high vertical cliff on the northern aspect of West Head. The shoreline is a sloping rock platform littered with boulders and rubble, steep in places but elsewhere almost flat like a true wave-eroded platform. Compared with Low Head, the platform here has less seaward slope, otherwise the shoreline is similar.

Two indentations mark major joints in the rock at West Head. On the eastern side of the more westerly of these, the platform ends in a vertical face, only a few feet high though the aspect is similar to the cliff line. This indentation is entirely rocky, and on the western side the surface, which is immersed at high tide, is flat, shingly and boulder strewn.

The second indentation has a pocket-beach deposit, more extensive than the first, with patches of gravel as well as the sand above it and with a conspicuous gap in the headland behind. The headland is divided by these joints into three peaks, and it curves finally to the south-east where the steeper shore bears little resemblance to a "platform". Its behaviour may be determined by a further joint line, but there is a considerable gap in the dolerite exposures between the western aspect of the headland and the Stockyard Hills a few miles to the south. The solid rocky shore gives way first to shingle and boulders, then to Green's Beach.

The backshore of the headland, apart from the vertical cliff line, is steep; it is approximately fifty feet high and consists of sandy soil. This is scrubby and it levels out above, except for the remnant of an ancient dune, and it passes inland some distance before rising again to the peaks of the dolerite hills. The shore platform, which has the aspect of a primary major platform, is considerably modified in places due to the massive nature of the dolerite rock. Its seaward edge passes into sand, and there is no apparent evidence of

a lower level platform except at the indentations where the features are structural. The broad features of the headland are similar to Badger Head, but there the shoreline is eroded across vertical strata of metamorphic rocks, and consequently it is irregular with deep gutters and with huge boulders in places, and there is little actual surface platform cut in the resistant Asbestos Range series.

At Green's Beach the dunes are lower than those of Badger Head Bay, and there is no protection at the eastern end of the beach. There is a deposit of dolerite shingle, from which point the beach turns southerly and becomes the western shoreline of the estuary. It is then continuous as far as Kelso, with fringes of dolerite shingle visible on the tidal flats. Behind the dunes at Green's Beach there is a flat area backed by a steep scarp approximately 110 feet above M.L.W.S., and this appears to be a former shoreline of similar age to the old bay behind the dunes at the western end of Badger Head Bay (Edwards, 1941). The scarp is continuous with the headland and curves towards Kelso, and the lower levels rise gradually in relation to it, apparently passing into the Stockyard Hills.

The flood plain behind the shoreline north of Kelso rises gently to meet this scarp face, but near the shore it tends to be marshy. It appears to be represented to a rather more limited degree on the eastern side of the estuary, where the higher level is the more extensive. Behind the scarp of the western shore, the Stockyard Hills rise from the plain surface which extends between these hills and the West Head in the direction of the Asbestos Range and also southerly behind the Stockyard Hills. Toward the Asbestos Range there is a marked rise in the terrain, passing first into the foothills and then into the main range. Near Badger Head there are old beach sands visible, and the drainage is impounded by the dunes. At Badger Head the lower hills are cut by a very well-marked former bay with old sea cliffs in the main range itself (Edwards, 1941).

2. Tertiary Faults

4

Carey (1947) described a series of faults in the Launceston district, which have given rise to a series of horsts, and two extensive troughs, which he named the Tamar Trough and the Cressy Trough. West of the Cressy Trough are the Great Western Tiers, and east of the Tamar Trough, "ramps" rise to the Ben Lomond Plateau which is also a horst. From the lower Tamar, two levels are readily discernible to the east, apart from the Ben Lomond-Mount Arthur block, and these levels are practically continuous except for the deep incision of the Fourteen Mile Creek which enters the Tamar at East Arm. The higher level (above 1,000 feet) ends more or less abruptly in the Mount Direction Range; the second, which passes into the George Range at George Town, is several hundred feet lower but a series of "foothills" continues to Low Head. The troughs appear to have been downwarps, with their flanks remaining higher than the central areas. The erosion of these banks has left the low dolerite ranges on each side of the river. On the West Tamar, low dolerite hills extend from Trevallyn main range itself (Edwards, 1941).

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Sketch Map of Geology, Lower Tamar River, North Tasmania.

are found as fossils at least as far as Supply Bay. The dolerite ridges of the Blackwood Hills and also that passing into the George Range may be the result of erosion. The question which arises here is whether or not the dolerite was originally continuous from the Blackwood Hills to the vicinity of the river mouth. This would require a vast removal of dolerite from this area but this is not unlikely.

There is an outcrop of Permian till at the southern end of Kelso Bay, and this may overlie the dolerite which outcrops nearby. Along the west bank of the estuary from the Kelso area, some wide expanses of dolerite shingle may also mark the presence of dolerite below the tidal flats. On the eastern bank there is an outcrop of Permian sediments between George Town and Low Head, but otherwise dolerite is present throughout, although the rock is usually masked by terrace deposits. George Town is situated on dolerite which may be seen in the river-bank at the township. Between Clarence Point and George Town the river is noticeably constricted, but it opens again into a considerable expanse southward in the Bell Bay-Beauty Point area. Between this area, East Arm and Supply Bay, Moriarty's Reach is again constricted and flanked by dolerite up-stream to the Devil's Elbow. On the west bank the main feature is the Blackwood Hills as previously noted.

One envisages the possibility that the Beauty Point-Bell Bay area marks a trough, the extent of which is not clear, as there is also the possibility that dolerite extended from the Blackwood Hills to Anchor Point as a ridge but was since removed by erosion. Permian sediments are exposed at West Arm, Middle Arm and between Beaconsfield and York Town, in places well above sea level. However, clays similar to those at Beauty Point are found over all this area and about Beaconsfield.

Dolerite was apparently continuous between the Anchor Point-Kelso Bay area and the George Range. But from the Kelso Bay-George Town area northerly the situation is less clear. If the shingle indicates the presence of a dolerite basement, as seems probable, then the most likely possibility is that the river occupies a considerable fault between the "Low Head block" and the "West Head block". There may be a small trough but this is not at all certain. The presence of the fault is suggested by the selection of this site for the erosion of the drainage system, which seems to have been determined very early in the physiographic history of the present features. It is remarkable that the river should have eroded a course through so much dolerite, when softer Permian beds exist nearer the Asbestos Range and appear to be the only significant rock in a line to Badger Head Bay. This line, with dolerite on the one side and the Asbestos Range on the other, would seem the logical course for the main drainage outlet, unless some other factor predisposed the present outlet and directions of drainage.

The presence of the Permian beds in the present outlet area on both banks of the river suggests that such beds formed part of the coastal scarp and lay on a dolerite basement. Thus erosion above present sea level between the George Town-Clarence Point area and the river mouth would be comparatively rapid. Hence, if a considerable fault is also postulated, one may envisage a strong early influence for a drainage outlet in the present position and of the present magnitude. Despite the resistance of the dolerite, erosion must have been far enough advanced to ensure the determination of the future drainage. However, it seems probable that another factor also had some influence, that is, the draining of the Tertiary lake or lakes.

The Permian beds in the West Arm show a marked dip, which does not appear to be related to the dolerite but which may be related to a Beauty Point-Bell Bay trough if such exists. One can envisage the flanks of this trough rising well above the centre in the same way as the Tamar Trough, with the exception that, on the western shore, the flanks are in Permian, and possibly Silurian, deposits instead of dolerite. The former presence of dolerite between the Blackwood Hills and Anchor Point may or may not discount the idea of a trough extending toward York Town or Beaconsfield. However,

all the features may be due to erosion aided in part by fault lines and possibly small grabens. There is no doubt that there has been a great deal of erosion, but several apparent alterations in sea level have in turn halted the process, infilled the valley and again commenced active erosion.

The present trend of the country into the Tamar is only an erosion feature. From Badger Head to the Asbestos Range the terrain slopes in the same direction, toward the Tamar, but it is brought up by the marked scarp at West Head, with the ridge of dolerite ending there. This area is occupied with what have been termed Quaternary sediments, which, as has been remarked above, are continuous with the higher terrace levels in the West Head-Kelso area (in part) and are probably representative of interglacial high sea. These sediments presumably lie on Permian sediments as these outcrop further inland at York Town. However, so far as is known, the whole area from here to the coast is marked by late sediments. The Tamar valley is traceable into Bass Strait, and there seems no evidence of another valley of any size near it. Hence those deposits, for which the Tamar itself is not responsible, are no doubt due to interglacial eustatic variations of the sea. Fairbridge (1949) believes that the topography of Bass Strait indicates a graben-type structure, and it was in this trough that the former "Tamar Major River" formed its valley. This type of structure seems in accord with that predominant in the Tamar valley and watershed.

Carey (1947) was doubtful of the existence of a "Trevallyn Fault", and this ridge of dolerite may be traced to the Blackwood Hills. It was interpreted by Carey as representing the elevated flank of the Tamar Trough, as already remarked. It is flanked to the west by the Glen Dhu Fault, which is apparently continuous and traceable in places, with the "fault scarp" at West Head. Near Beaconsfield there has been much erosion on this line, and Permian beds are exposed along Middle Arun Creek and Middle Arun, while in Beaconsfield a deep lead indicates erosion by a former stream to 270 feet below present sea level. The present surface is largely occupied by Tertiary clays which, between Beaconsfield and West Arun, pass under Quaternary gravels. This area may be part of the graben postulated in the Bell Bay-Beauty Point area. These clays and gravels are further discussed below.

The block elevated between the Glen Dhu Fault and the Breadalbane Fault is represented in the Beaconsfield area by the Blue Hill, Cabbage Tree Tiers and the Blue Peaked Hill, and it possibly extends as far as the Holwell area, but there are other faults in the area, some of which are indicated by Montgomery and Ward (1892). Further north the block is represented by the series of hills flanking the Asbestos Range. Between the Breadalbane Fault and the Hudspen Fault the "Hummocky Hills Horst" passes into the Asbestos Range, and it is the highest of the blocks. At the Hummocky Hills near Epping, south of Launceston, a height of 1,574 feet is reached, and north of Frankford the height is the same or greater, but it falls to a few hundred feet at Badger Head. When the Asbestos Range is viewed from the west in the vicinity of the Rubicon Estuary, two levels are visible, and the lower of these is thought by the writer to be representative of the block between the Hudspen and Longford Faults. From the Exeter Devonport Road, after passing this level, a marked depression may be seen before the Asbestos Range proper. There is another at the Glen on the Exeter side of the range, which is like a small graben on the Breadalbane Fault line. The road rises steeply from here toward Exeter, as though ascending a fault scarp.

3. The Tertiary Deep Lead

On the West Tamar, north of the Blackwood Hills, the dolerite is represented only by more or less isolated hills, until the Stockyard Hills are reached; but these are not extensive and there is another short gap towards West Head. Between the Blackwood Hills and Anchor Point on the West Arm (above which lies one of the hills) dolerite has been found as small boulders at Sandy Beach, but otherwise it appears absent from this wide gap.

This gap is occupied by the Beauty Point—Ilfracombe "peninsula" between Middle Arm and West Arm, which shows several stages of erosion and deposition independent of the dolerite. Thus an ancient stream appears to have flowed through the Beaconsfield area to Inspection Head on the Tamar in the middle of the "gap". This was infilled with basalt (said to be Lower Pliocene) and the drainage impounded, while, presumably, lateral streams developed, perhaps the forerunners of those now entering Middle Arm and West Arm. The flow was apparently breached by the Tamar near Middle Island. The ancient streams flowed from the Asbestos Range across the dolerite to the Tamar, removing most of the dolerite from the "gap" area, while the immediately pre-basaltic and post basaltic streams eroded their beds in the Permian. The terraces indicate that these valleys were subsequently "filled" and renewed several times.

The Beaconsfield Deep Lead, which is also called the Brandy Creek Deep Lead, appears to occupy a narrow, rather deep valley representing approximately 400 feet of erosion. The width of the valley, as indicated by the basalt at Inspection Head, and the clays at Beaconsfield (which appear to be residual from the decay of the basalt), seem narrow and suggest rapid erosion. However the hardness of the Silurian beds in which this valley was cut may have had a significant effect in controlling the extent of the valley. Montgomery and Ward (1892) indicate a fault below the lead and this also could have a bearing on the nature of the valley. Singleton (1941) puts the age of the lead at Adelardian, and physiographic evidence suggests this age or younger, not Lower Pliocene as has been suggested also. There is no reason to believe that there has been depression in this area since the basalt, so the depth of the ancient stream is an indication of the sea level of that time. That would thus be about 270 feet lower than the present. Carey (1947) found no evidence of uplift of consequence, and he regarded the basalt as indicative of the thalweg of Pliocene drainage of the time. The basalt lies on the clays and gravels of the partly filled valley and apparently passes only a little below sea level at Inspection Head, which suggests that the sea level had been rising again—if a eustatic approach to the problem is to be taken. The evidence tends to suggest the fall of the sea prior to the onset of glaciation at the "beginning" of the Pleistocene, and the rise subsequent to the first glacial stage, of which no evidence has been previously recorded from Tasmania. This would seem dubious on present correlations, but there is evidence that climatic deterioration may actually be dated from the Kalimna-Adelaidean boundary, according to Fleming (1953). This then would indicate an earlier stage and greater depth than previously noted in Tasmania, so far as is known to the writer.

4. The Clays and Gravels

The clays which may be observed south of Beaconsfield and which pass under the gravels capping ridges north of the town, lie on the Permian bedrock and may be derived from the erosion of the ancient peneplain (Carey, 1947). They are thin where they lie on the Permian but have been traced below sea level at Beauty Point and below the basalt (Twelvetrees, 1914). Although they occur at a lower level than the basalt, they are also at higher levels, so that the exact relationship at the moment is obscure. The clays themselves were eroded before the next depositional phase, that of the gravels.

The gravel beds lie on the ridges flanking the Tamar between Beaconsfield and West Arm and thence toward West Head. At the West Arm the beds extend a considerable distance down the side of the ridge bringing the north-west side of the Arm and also on the opposite side. Clay is found only a few feet below the surface near the top of the ridge. A check indicated that only one bed was present and that it follows the contour of an old surface, suggesting that the underlying clays had formed a land surface before the deposition of the gravels. The surface of the clay is uneven and dark coloured, but this could be due to leaching from the present surface soil. There is little to indicate the presence of a former soil surface on the clay, and it is possible that

it was removed before the gravel was deposited. The present topography appears to conform to some extent in places with the old surface. At the foot of the ridge is a marshy area through which a seasonal stream flows when there is sufficient water. It flows partly around one of the dolerite hills—marked on the writer's map (Kershaw, 1958a) as Bull's Hill—and it is incised up to fifteen or twenty feet below the present surface near the hill in narrow "gorges", before entering the Tamar.

An area of gravel is to be found on the banks of Anderson's Creek near the Settler's Range, some miles from the West Arm. In their lower reaches, Anderson's Creek, Massey's Creek and York Town Rivulet lie in a wide valley incised in Permian sediments. In this valley, near Anderson's Creek where the old mine tramway crosses this stream, there is also an area of Tertiary clays, which suggests that this valley is older than these deposits. The main streams have cut new valleys in the floor of this old valley, but these are of no great extent. However, these streams have contributed to extending the older valley, due to the successive phases of deposition and erosion, involving clays, gravels, and probably Pleistocene terrace deposits as well. The "pre-clay Anderson's Creek" was presumably a tributary of the Beaconsfield Deep Lead stream. (See also comments in previous section.)

A considerable amount of erosion must have followed the deposition of the gravels, as they have been removed entirely from some even deep areas and do not seem to be related to later gravel deposits associated with terraces. The well-worn pebbles of these latter deposits appear to have considerable affinity with the Permian conglomerates and were conceivably partly derived from this source. On the other hand, the white gravels appear more likely to be a derivative of the Silurian beds near Beaconsfield. These beds were elevated by the Tertiary uplifts, and Permian beds lying on them were removed early, whereas the beds from which the pebbles would have been derived lie at lower level and were not elevated near Beaconsfield. Nevertheless Permian is preserved at higher levels south of Beaconsfield.

In the vicinity of Block 11, Clarence Point Sub-division, on the West Arm, the greatest depth of gravel in this area is found. This is a quarry site on a hill-top which reaches 180 feet above M.L.W.S. Tide. The gravel bed is approximately eight feet thick in places. As elsewhere the beds lie on clay, but here the surface of the clay is more noticeably black and gritty for depths of up to two inches or a little more. This site is of particular interest, for in addition to representing the furthest point north-east along the West Arm at which gravel is found before the dolerite hills intervene, exposures show that the beds here lie above dolerite. Moreover, in the floor of the quarry, there is an exposure of a rock of similar nature to the Permian exposed nearby in the West Arm, but this is very small and hence uncertain. Finally, some four feet depth of fine white sand is preserved over a small area lying on the gravel at the highest point. Near the sand exposure there is an exposure of fine white grit, about two feet thick, somewhat lower than the top of the sand bed but above the base. The sequence of beds on this quarry site from the top is as follows:

(a) Sand and/or grit	..	..	4 feet
(b) Gravel	..	..	8 feet
(c) Clay	..	..	20 feet
(d) Permian?	..	..	25 feet
(e) Dolerite	..	..	at 123 feet above M.L.W.S.
(f) Terrace sands	..	..

Beds a, b and c appear to lie on the surface of a ridge or hill, as noted elsewhere on the Arm. Thus the gravel at the sides of the quarry is at a lower level than the clay in the centre. Moreover, the measurements given are of the exposures and are not necessarily equivalent to the depths of the beds. The dolerite exposures are in the form of surface stones and boulders with some patches of solid rock. Below the dolerite, the ridge levels out on a surface of

sandy soil which is interpreted as a high-level terrace. This level is continuous along the ridge above the West Arm, toward the south-west, until the vicinity of block 17 where there is a gentle rise again. From this point the gravel belts begin to increase again from practical insignificance to a depth of two or three feet, but the depth is reduced again further on as the terrain falls toward York Town Rivulet. In a northerly direction the gravel follows the line of the dolerite hills which reach to higher altitudes than the beds. North-east, across the dolerite, there is a small area of gravel between Anchor Point and Clarence Point, rather nearer the latter locality. This has evidently been preserved by the surrounding dolerite, and all other traces on the Tamar side of the hills have long since been removed by the river erosion.

At the West Arm, seasonal drainage has cut a narrow valley between blocks 12 and 13, and in the bed of the stream Permian mudstone is exposed near the corner of the orchard in block 13. This exposure in the stream bed is observable most of the way down the slope to the West Arm, but the water appears to run on the surface of the rock and is not incised into it. Some gravel lies on the surface of the rock and seems to have been redeposited from the higher beds, which are fifteen or twenty feet above and very thin here. The banks of the stream show a considerable depth of blackish sandy soil, but no attempt was made to discover what lay beneath this apart from the mudstone in the stream bed.

A chance excavation alongside a dyke between Clarence Point and Kelso revealed a small pocket of white gravel at a slightly lower level than the nearby terrace gravels. This pocket presumably accumulated against the dyke when it stood out as a reef in the pre-terrace stream. There are fine white sands at this point also, though at a somewhat higher level and not related to the dyke. These may be related to the small deposit in the quarry referred to above, but the latter is one hundred feet higher.

5. *The Tertiary Lakes*

Fairbridge (1949) concluded that the dolerite intrusions did not necessarily "bulge up" the central strip of Tasmania, but, while remaining above sea level, the area reacted as a "down warp". During peneplanation, a great deal of dolerite was removed (Carey, 1947). Following the uplifts, streams working back from the coast would not need to cut through much dolerite at first, and it has been suggested already that the presence of a fault and of Permian rocks probably assisted in defining the lower Tamar. But a considerable body remained in the Blackwood Hills area and to the east as indicated by the rock still preserved and by the necessity to envisage a considerable block impounding the drainage to form Lake Tamar.

The presence of the clay about Beaconsfield, Beauty Point and the West Arm area, and even somewhat further afield—apparently not related to the Lake Tamar deposits, which have also been regarded as of Tertiary age—is, as Mr. E. D. Gill has pointed out to me, most likely to be lacustrine in origin. If the clay which Twelvetrees (1914) described as sub-basaltic in the Inspection Head area is the same, then Tertiary age tends to be substantiated, but nothing definite can be said. The clay reaches much higher than the basalt in the area and is at least six feet thick in many places where it is associated with the white gravels, but it is very much thicker in the Beauty Point area where it has been bored to below sea level (Twelvetrees, 1914). A lake is envisaged for the Beauty Point-Bell Bay area which, when it filled this basin, overflowed the surrounding country-side and deposited a veneer of clay over its extent. The clay appears to be older than the basalt and is certainly found at much higher topographic levels, as already noted.

Over 1,000 feet of sediments accumulated in Lake Tamar over a vast period of time, and it seems that at least 600 or 700 feet of dolerite was removed after the lake began to drain. There is no evidence that any factor other than the Tertiary uplifts was responsible for the formation of the lakes. This is important, as the uplifts were stated by Carey (1947) to be Lower Miocene.

Mr. E. D. Gill informed me, and this has since been published (Gill & Banks, 1956), that he had evidence that the lake beds are much older than was previously thought. So it must be presumed that the earliest uplifts are also older than hitherto believed. Gill & Banks (1956) now place the commencement of faulting in the Lower Tertiary, i.e. Lower Oligocene or earlier.

The possibility or even probability of a smaller lake north of Lake Tamar raises new points in tracing the drainage pattern. Instead of having to envisage one block of dolerite impounding drainage consequent to the uplifts, two must be envisaged. The writer has already drawn attention to the present distribution of the dolerite in the area which constricts the Tamar between George Town and Clarence Point and again at Moriarty's Reach. It has been suggested already that Lake Tamar ended in the vicinity of the Devil's Elbow, and the dolerite is assumed to have been continuous between the Blackwood Hills across Moriarty's Reach toward Mount Direction and toward the George Range. Similarly it is assumed to have been continuous from the George Range across the river from George Town to Clarence Point and the series of dolerite hills, as they are now, on the west bank. The fact that much less evidence, by way of lacustrine deposits, is present to indicate the existence of the more northern lake, is not especially significant, as this is easily accounted for by the probable amount of erosion over the period. The clay may have been very much deeper over the whole area than is now indicated, as it has all been subjected to erosion for a long period, and in some places it is preserved at all only because of the subsequent deposition of the gravel beds. In addition, if the lake is to be assumed to be as old as would be required for the relationship to Lake Tamar to have existed, erosion must have commenced on its deposits long before the larger lake was affected. Surely it must have been drained before drainage of Lake Tamar was much advanced.

The drainage head worked back from the coast, possibly along a faint line, and cut a gorge between George Town and Clarence Point. The lake impounded by this dolerite block was then drained, and streams developed from the higher land in the courses of already existing minor drains into the lake. This higher land was presumably that now represented by the Asbestos Range and Mount Direction, which would necessarily have originally been the only features above the lake beds. This stream development would be most rapid from the Asbestos Range, as it flowed over clay and then Permian sediments. Because of the distribution of the sediments, the major streams eventually developed along the line of the Brandy Creek Deep Lead to Inspection Head—with a tributary or tributaries ancestral to Anderson's Creek, which also lies in an area where much erosion is apparent. Due to the concentration of the drainage toward the Inspection Head area, all the apparent dolerite has been removed from this area except for a few boulders.

Another main tributary came from the east, probably the ancestor of the present Fourteen Mile Creek as there is a considerable gap in the ranges in that area, and it found a course down from the dolerite in the East Arm area. A tributary of this stream, working back along the Moriarty's Reach line, is envisaged as breaching the probably nearly brimming Lake Tamar. From then on erosion would be progressively accelerated and a classic gorge cut through the dolerite, while the rapid growth of the future Tamar would soon assume the ascendancy from the Beaconsfield stream.

Once connection was made, the course of the Tamar was certain, as a vast new watershed was then opened. Carey (1947) envisages the subsequent course of events as the rapid scouring of the soft lake sediments until the head of erosion reached Launceston, where the South Esk was faced with the task of cutting the present gorge through the fault blocks in its path. Griffith Taylor (1922) quoted the gorge as evidence of late uplift and also remarked that it had been suggested as evidence of the eustatic variations of the Pleistocene.

The whole process was well advanced when a presumed fissure eruption of basalt filled the valley of the Beaconsfield stream and for a time blocked the

Tamar. It is possible, but it does not seem at all likely, so far as one can judge from the evidence, that the basalt impounded the Tamar to a sufficient height to account for the clays of the Beaconsfield-Beauty Point area; and this is not regarded as a reasonable explanation, even if it must be admitted that the explanation already advanced is not particularly clear from the evidence available. In any case the Tamar would not long be blocked by the basalt, and subsequent erosion would readily remove all evidence other than the remaining basalt itself. There are no other erosion features which cannot be accounted for satisfactorily by the hypotheses advanced above.

Lewis (1927) had envisaged late movements, and Fairbridge (1949) agreed with him, suggesting movements of a few hundred feet, possibly as late as early Pleistocene. However, Carey (1947) found no evidence of such movements in the Launceston area. That the basalt extends below sea level at Middle Island, simply indicates the thalweg of drainage, as pointed out by Carey (i.e.). Montgomery and Ward (1892) regarded the 270-foot deep lead as evidence of a 300-foot negative movement, but this seems unlikely and another theory has been advanced herein to account for the features coincident with the lead. Carey (i.e.) remarks the drowning of the valley as due to a 270-foot rise in sea level some ten thousand years ago. It is not intended to discuss this or the evidence of the terraces here, and notes on those near the mouth of the river should be presented at a later date.

On the evidence as it has been interpreted, the sea does not seem to have reached the present Tamar until after the formation of Bass Strait. In the previous notes (1955, p. 155) it was stated that eustatic fluctuations could not have affected the present Tamar prior to the "Yolande Glaciation"; this is quite incorrect as it stands, apart from any consideration of the actual age of that glaciation. It had been intended to suggest that estuarine conditions did not develop until after that epoch.

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ADDITIONAL NOTES ON NORTHERN TERRITORY MOSES

By J. H. Willis*

In the *Victorian Naturalist*, Vol. 74, pp. 104-5 (November 1957), I recorded eight species of mosses as new to the Northern Territory. It is now necessary to adjust one of these records and to add two more species to the twenty already known from the Territory.

FUNARIA APOPHYSATA (Tayl.) Broth., 1903.

Determination of the Hugh River Gap specimen (i.e.) is erroneous, having been made from very immature fructifications. Subsequently, this damp sod of *Funaria* plants was put aside, and in time many of the setae elongated: the capsules ripened and shed their opercula. To my amazement, the colony was not *F. apophysata* at all, but a mixture of *F. glabra* Tayl. and *F. gracilis* Broth.! Both of these are peristome species but the latter has not been noted in Central Australia previously. Following are the details of the two new records.

FUNARIA GRACILIS (Hook. f. & Wils.) Broth., 1903: Hugh River Gap, 40 miles S.W. from Alice Springs, on damp shaded ground under *Eucalyptus camaldulensis* (N. Forde, C.S.I.R.O., No. 873, Aug. 1947); Standley Chasm, 30 miles west from Alice Springs, along water-line of a shaded permanent spring (N. Forde, C.S.I.R.O., No. 947, Oct. 1957); Mt. Liebig, about 34 miles west from Haast Bluff (Professor J. B. Cleland, Aug. 1957).

BARBULA TORQUATA Tayl., 1846: Mt. Sir Henry, almost on South Australian border, 17 miles S.W. from Kulgera Homestead, under granite rock-ledge with *Chanthus* (N. Forde, C.S.I.R.O., No. 891, Sept. 1957).

These mosses are both exceedingly widespread species in the southern half of the Commonwealth, occurring in many semi-arid parts of South and Western Australia. The former is distinguished by its erect peristome capsule on slender setae, the latter by its papillate, obscurely areolate foliage (revolute at margins) which becomes spirally twisted in the dried state.

MICROSCOPICAL GROUP

At the meeting on Wednesday, March 19, Mr. Robert Lukey spoke on the group of minute marine creatures known as Radiolarians. This was demonstrated by projected copies of illustrations from reference books, and sixteen microscopes on the bench were devoted to examples of the creatures.

For details of the next meeting, see "What, Where and When". The Microscopical Group would like to see a greater percentage of Field Naturalists at its meetings, as it feels they are missing something interesting and instructive.

* National Herbarium of Victoria.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

NOTES ON WILSON'S PROMONTORY. MARCH 1957

South Gippsland's weather would not impress our Queensland visitors to Wilson's Promontory National Park in mid-March. It ranged from heavily overcast to wet at times, except for the very last day of their stay. That day was perfect, and showed the glorious beaches and headlands of the Prom. at their best.

Signs of the recent rough weather were the bodies of several Little Penguins washed up on the beach, and the flocks of seagulls that begged hopefully for scraps round each cottage door and campsite.

Wallabies, ringtail possums and wombats were plentiful and tame. Indeed it is an eye opener to note the confidence of beasts and birds that are never hunted or shot at. Even the shy deer allowed themselves to be seen occasionally. Rabbits, unfortunately, are still all too numerous and are a bad advertisement for our National Park. They seem long-legged and gaunt compared with the rye-and-clover ones of the farming country. With the introduced deer they must compete seriously with the native herbivora for the available food supplies.

Several garden escapes are to be seen in the vicinity of the old building sites at Darby River, the worst of them, to my mind, being the fleshy-leaved *Senecio mikkanoides*, a rampant creeper. This is also established at Tidal River.

The heathlands of the Prom. seem to carry a few flowers at all seasons of the year. The Common Heath showed patches of pink and white and the Red Correa was in bloom.

Yanakie Plain, as we all know, has gone under the plough, and even some of the wide roadsides are spoiled and scratched bare by the constant passage of heavy machinery. There still remain, however, some very good roadside strips, the best of which is near the Promontory end of the Soldier Settlement Estate. Where the road rises slightly with a banksia tree on either side, the flora is clean and unspoiled, and well worth enclosing. Introduced grasses will not make much headway there without the aid of superphosphate or of camping cattle.

Again, on the Foster side of the Estate, there are two good wide areas, islanded between the straight telegraph line and the bend of the road where it skirts the rise. In time to come, when productive farms line the road across the plain, these roadside reserves would show the nature of the original flora and emphasize the enormous changes that science has wrought upon the face of nature.

As I drove alone along the deserted road across the grassy plain that lies between the sand-hills and the valley of the Darby River, two emus near the road brought me to a stop. In the hope of attracting them closer I waved a bright scarf out of the window and awaited results. The two were curious but uneasy and just milled around in one spot. Four more emus of bolder spirit appeared on the scene and they all approached and closely inspected the car, the big leader stretching his neck from side to side, and emitting at intervals that peculiar drumming grunt that expresses surprise in emu language. The human voice in reply put them at once to flight, or to be more truthful, to fright. The whole party ran off over the skyline, their feathers like grass skirts flopping clumsily above skinny legs. I have seen the Yanakie emus before, but always at a distance, and it was a very pleasant experience to have them come so close.

—ELLEN LYNDON, LEONGATHA

CRESWICK FIELD NATURALISTS CLUB

This Club held its fourth Annual Meeting on Wednesday, February 12, in the new R.S.L. Club-room. Office-bearers for 1958 were elected, as follows:

President—Mr. A. P. Dunn.

Vice-President—Mr. A. C. Sonsee.

Hon. Secretary and Treasurer—Mr. H. L. Barclay.

Committee—Messrs. C. Eddy, S. Northcote, E. Prendergast and E. Voigt.

The Secretary read the annual report, which covered a year of variety in nature subjects dealt with by members. The subject for the evening was a talk on the Australian Phalangers; and among the exhibits were five species of snails, a number of beetles and a small snake. The last was an example of the White-lipped Snake, *Denisonia coronoides*, which is venomous though too small to harm humans.

Three new members were nominated for election at the following meeting. Meetings are held on the second Wednesday of each month, and, on behalf of the Club, the President extends a cordial invitation to any visitors from the F.N.C.V. or other Clubs who may be able to attend at these Creswick meetings.

WHAT, WHERE AND WHEN**F.N.C.V. Meetings**

Monday, April 14—Presentation of Natural History Medallion to Mr. C. E. Bryant.

"F.N.C.V. Excursion to Genoa District", by N. A. Wakefield.

Monday, May 12—"How to Collect Insects", by A. N. Burns.

Monday, June 9—Annual General Meeting, and Presidential Address.

Monday, July 14—Members' Night.

F.N.C.V. Excursions:

Sunday, April 20—Botany Group Excursion to Emerald. Take 8.55 a.m. train to Upper Ferntree Gully, then bus to Emerald. Bring one meal.

Sunday, May 4—Parlour-coach excursion to You Yangs. Coach leaves Batman Avenue 9 a.m. Fare 16/- Bring two meals. Bookings with Excursion Secretary.

Sunday, May 11—Geology Group Excursion to Cave Hill, Lilydale. Travel details at Group Meeting.

Group Meetings:

(8 p.m. at National Herbarium, unless otherwise stated.)

Wednesday, April 16—Microscopical Group. Speaker: Mr. Charles Middleton. Subject: "Getting the Most out of an Ordinary Microscope".

Friday, April 18—Botany Group. To begin at 7.45 p.m. with a talk "Botany for Beginners" by Mr. Swaby, after which there will be a Members' Picture Night. You are invited to bring slides. An escort will be available from the corner of St. Kilda and Domain Roads.

Monday, May 5—Entomology and Marine Biology Group. To be held in Mr. Strong's rooms at Parliament House at 8 p.m. Enter through private entrance at south end of House.

Wednesday, May 7—Geology Group. Speaker: Mr. Baker. Subject: "Introduction to Sedimentation".

—MARIE ALLENDER, Excursion Secretary,
19 Hawthorn Grove, Caulfield, S.E.7

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